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Get Ready for Touring Season

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MOTOR AGE

Volume XXXV
Number 20

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CHICAGO, MAY 15, 1919

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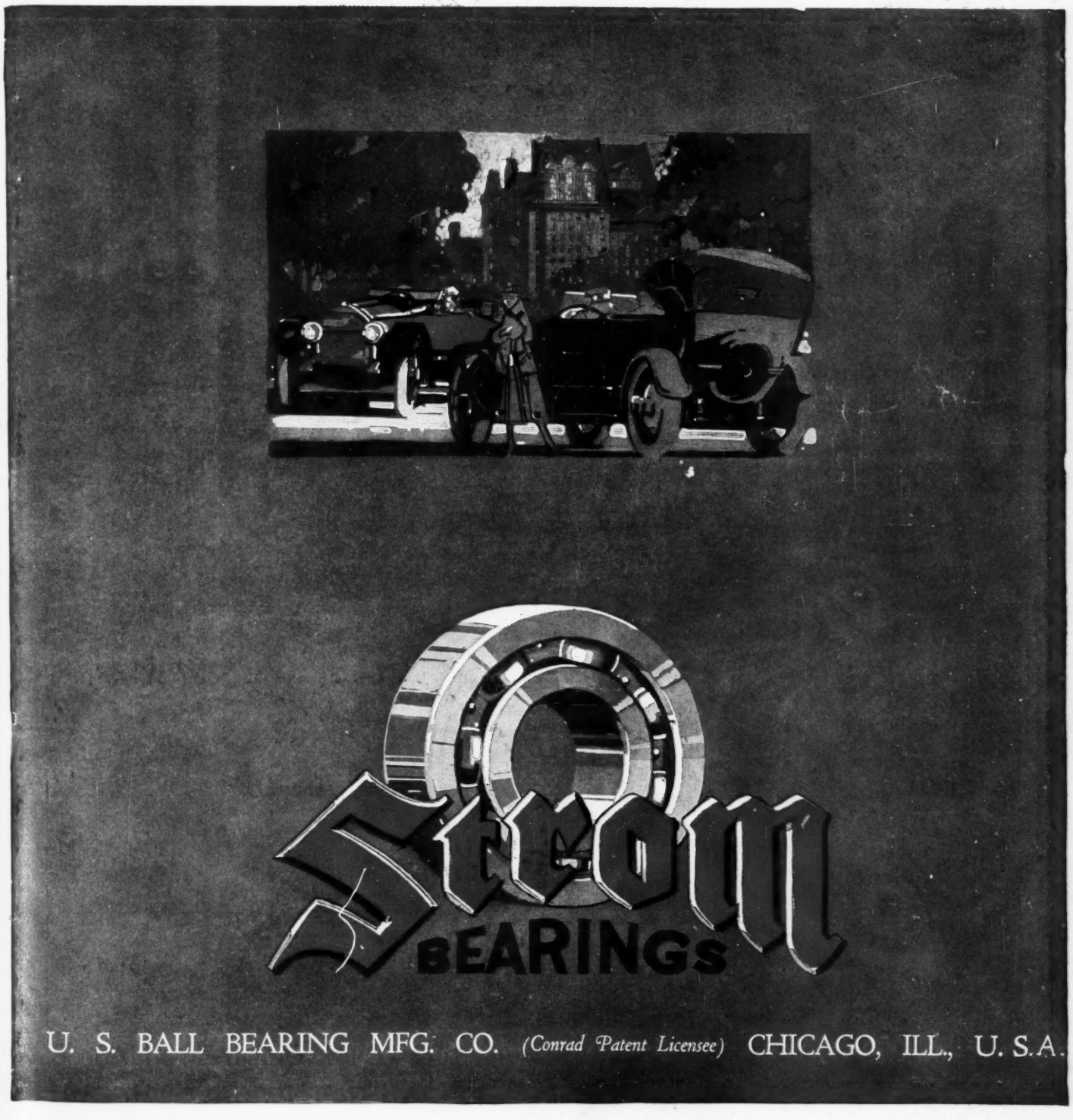

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THE easiest and quickest way to repair leaks in radiators, pumps, water jackets, motor head gaskets, hose connections, etc., is with Johnson's Radiator Cement. It will stop leaks immediately without laying up the car—no mechanical experience required—all you have to do is remove the cap and pour the Radiator Cement in the radiator. No tool kit is complete without a can of Johnson's Radiator Cement. It overcomes the inconvenience of laying up one's car—will ordinarily seal a leak in from two to ten minutes.

JOHNSON'S RADIATOR CEMENT

Johnson's Radiator Cement contains nothing which can clog or coat the cooling system and is absolutely harmless in every respect. It blends perfectly with the water until it reaches the leaks. Just as soon as it comes in contact with the air it forms a hard, tough, pressure-resisting substance which is insoluble in water and consequently makes a permanent seal.

A half-pint of Johnson's Radiator Cement is ordinarily sufficient for a Ford or other small radiator—for medium size cooling systems use a pint and for large cooling systems, a quart.

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S. C. JOHNSON & SON, Dept. M. A., Racine, Wis.
Established 1882

MOTOR AGE

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MOTOR AGE

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A realization of this fact, on the part of builders of automotive units and electrical apparatus therefore, explains the vast preponderance of "NORMA" equipped magnetos and lighting generators in the automotive world. Responsible builders know that "NORMA" gives security against bearing troubles.

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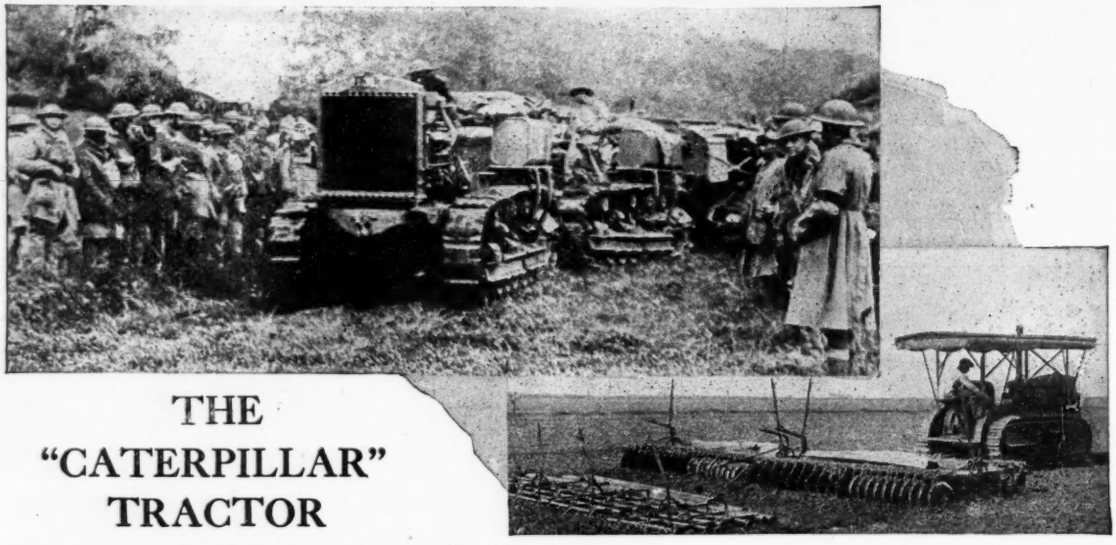

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TRACTOR
IS HOME FROM OVERSEAS!

IT is ready again for the labor of Peace, eager for its work of plowing and harrowing fertile fields or breaking the stubborn acres of virgin land. After strenuous years of hauling the U. S. and Allied artillery, the "Caterpillar" is ready again to haul trains of farm produce to market, to haul logs to the mill—to transport ore across mountain and desert trails—to build and maintain highways everywhere.

And from overseas thousands of American boys are returning who operated these machines at the Front; *they* know how "Caterpillars" *did the work* and were always dependable no matter what the conditions might be!

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In farm work the year 'round, on the largest industrial projects, "Caterpillar" owners and operators are always enthusiasts; *they* know "the world's greatest and best known farm tractor" is *always dependable.*

With its years of leadership in farm and road work, its *"Distinguished Service"* throughout the whole world war, the "Caterpillar" is years ahead of all other makes. A "Caterpillar" agency obtained now insures a permanent, profitable business for dealer or distributor. Inquiries invited in regard to available territory.

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"CATERPILLAR"
TRACTORS REG U S PAT. OFF.

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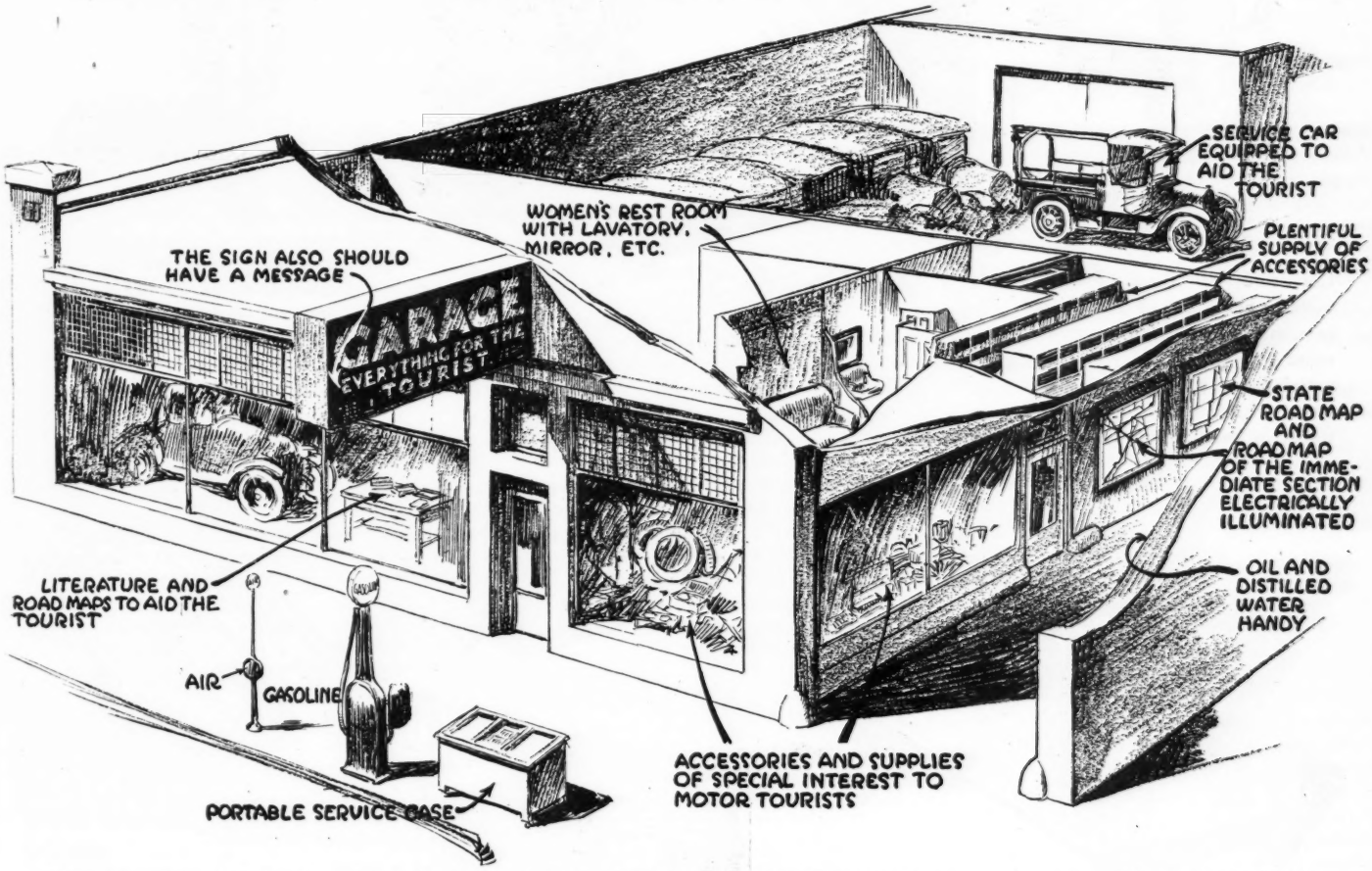
MOTOR AGE

Get Ready for the Touring Season

The Annual Hegira to the Open Highway Has Begun and Many Motorists Will Be Coming Your Way—Are You Ready to Take Care of Them?

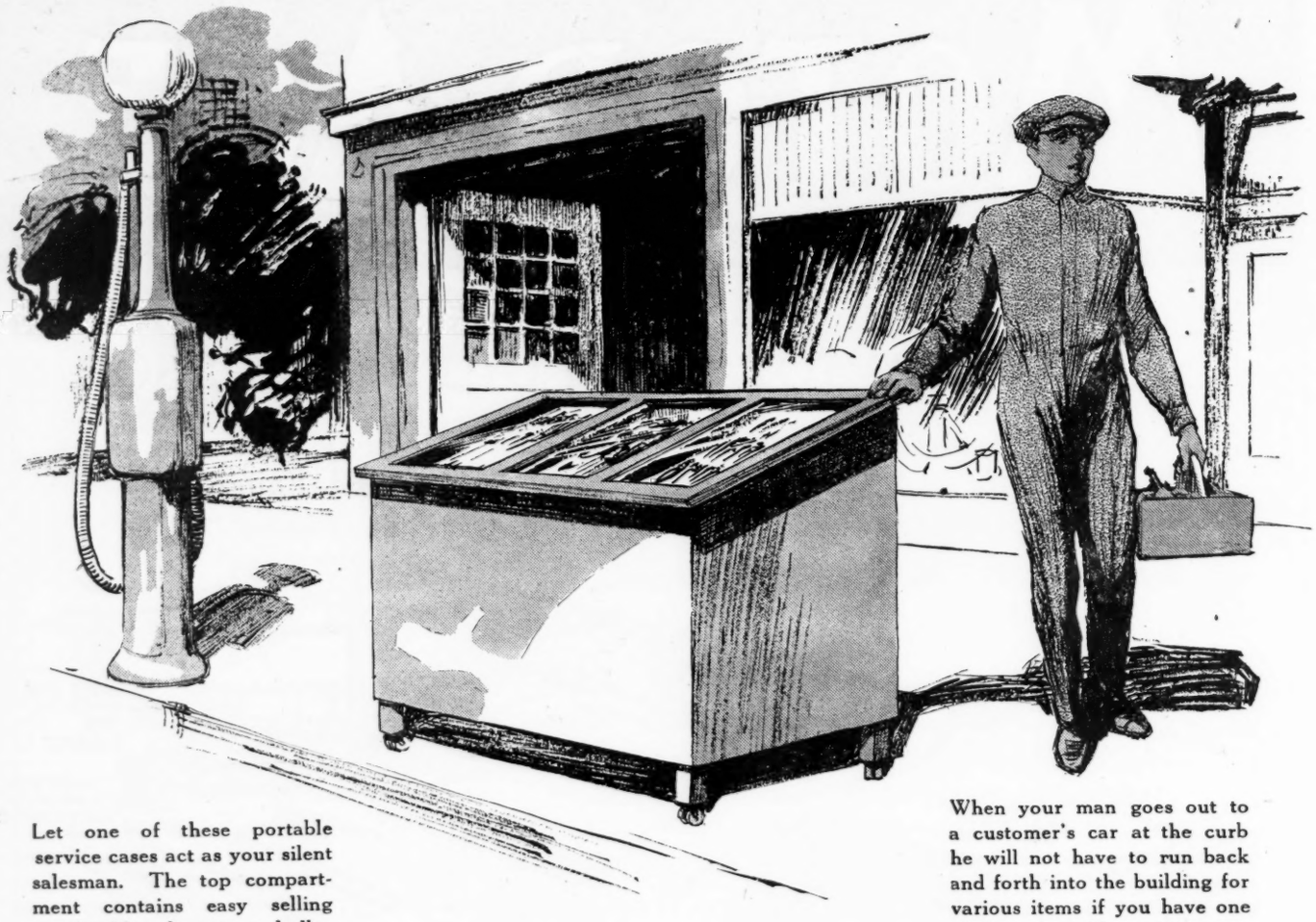

SERVICE CAR EQUIPPED TO AID THE TOURIST
WOMEN'S REST ROOM WITH LAVATORY, MIRROR, ETC.
PLENTIFUL SUPPLY OF ACCESSORIES
THE SIGN ALSO SHOULD HAVE A MESSAGE
GARAGE
EVERYTHING FOR THE TOURIST
STATE ROAD MAP AND ROAD MAP OF THE IMMEDIATE SECTION ELECTRICALLY ILLUMINATED
LITERATURE AND ROAD MAPS TO AID THE TOURIST
OIL AND DISTILLED WATER HANDY
AIR
GASOLINE
ACCESSORIES AND SUPPLIES OF SPECIAL INTEREST TO MOTOR TOURISTS
PORTABLE SERVICE CASE

Cut-away view of ideal garage and service station, showing the items that should receive your special attention if you are out for the tourist trade

YOU can cash in on touring only by preparation made beforehand to take care of that class of trade. Again let the dealer and garageman look to their equipment and methods of shop conduct. If your shop is not fitted out in this way already, it can be made more efficient by the addition of labor-saving equipment such as engine stands, piston vises, aligning jigs. Of course the repair shop can take care of only that amount of business for which it has workmen, but you will find, if you have not already done so, that one man can do the work of two or three if he is provided with up-to-date garage equipment. Many shops have found this out, and rather recently, too, for the shortage of mechanics during the war led to many short steps and time-saving devices.

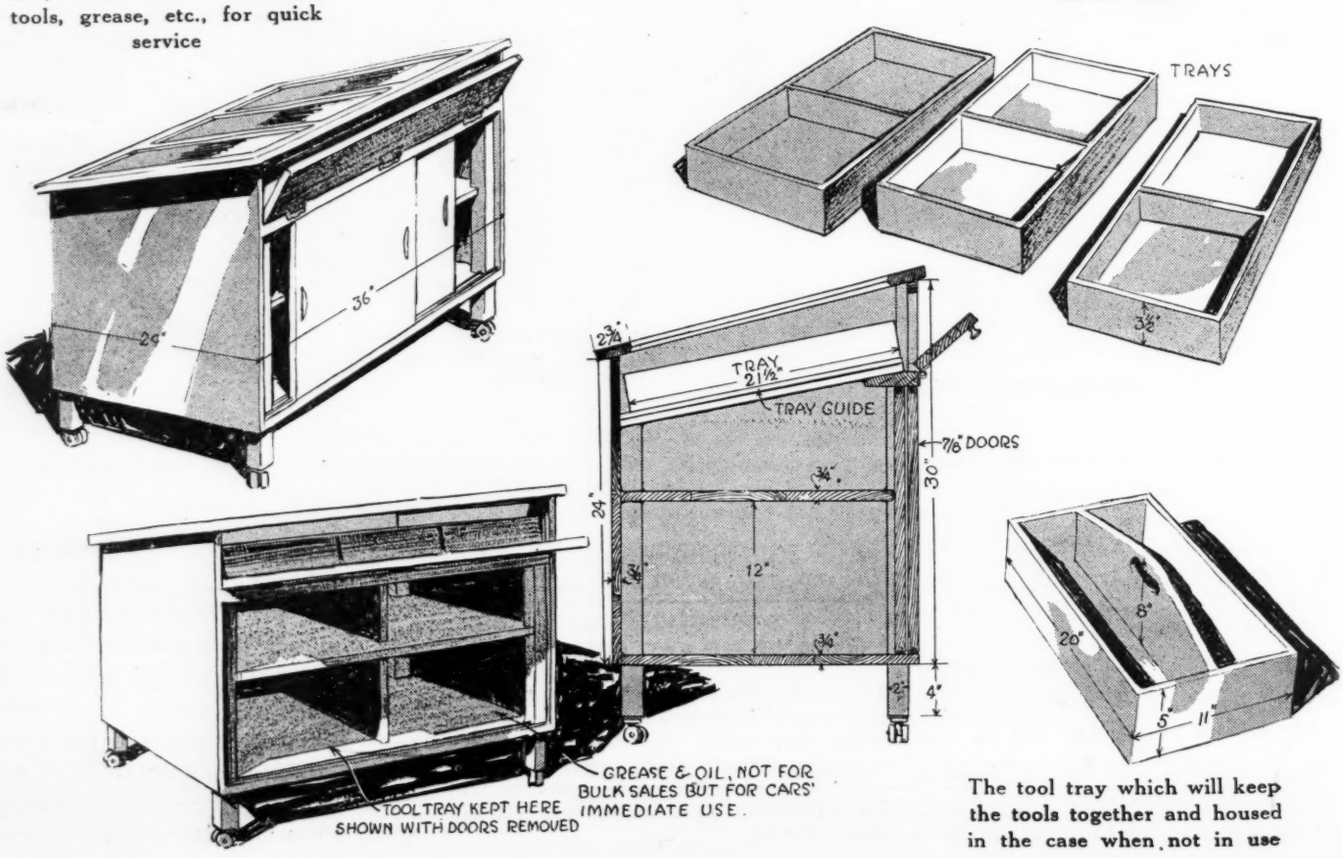
EDITOR'S NOTE:

No matter how many customers you attract to your place, through efficient advertising or whatnot, unless you get ready to take care of them and do take care of them when they come, the time will arrive, sooner or later, when the tree will have been threshed and all your customers will know that all the persimmons left on it are sour.—Editor.

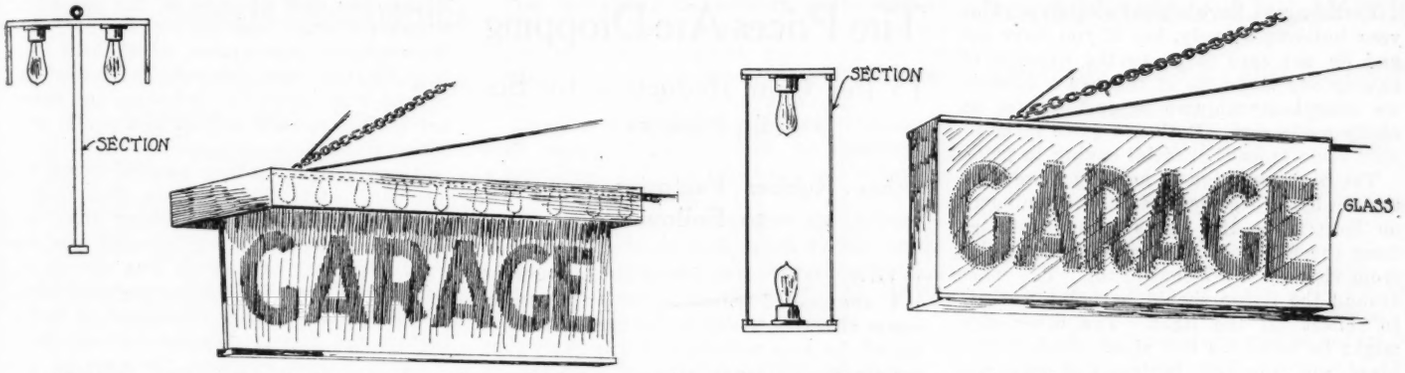


Let one of these portable service cases act as your silent salesman. The top compartment contains easy selling articles like plugs, tape, bulbs, etc., while below are kept, tools, grease, etc., for quick service

When your man goes out to a customer's car at the curb he will not have to run back and forth into the building for various items if you have one of these portable service cases at the curb



The tool tray which will keep the tools together and housed in the case when not in use



Here are two styles of electric signs that a dealer can make or have made without much outlay in money. A good sign is a decided asset to get tourists your way, day or night

This man should be able to drive the service car and make such repairs as might be needed. This would indicate that a good all-around man is needed for this job. Many used cars will be driven this year, and, and this will call for more attention than ne wones. Hence, night service, emergency repairs, etc., will be more in demand than ordinarily might be the case. While a shop might not keep more than one eye open at night, so to speak, that one must be competent and rather above the average in skill.

Perhaps one of the most valuable addition a dealer or garageman might make for the tourist season would be a portable service case such as is illustrated, complete with dimensions, here. This is for use on the curb and will save many a trip inside. The case is fitted to bring needed accessories right up to the motorist, as well as to bring needed tools and supplies to the mechanic at work on a car at the curb when some minor adjustment or repair is involved.

How Case Is Made

The case is made with an inclined top that is covered with glass. This is so the contents easily can be seen from within the car. Under the top tray, which contains the articles exposed to the public gaze, is a tray in which should be kept the tools. A special container for the tools is provided to keep them off the sidewalk when not in use. Along with the tools are provided grease, rags, etc., all of ready service to the workmen and of ultimate service to the customer in the time saved.

The top tray is intended for a silent but efficient salesman. It might contain the following:

Spark plugs
Tape
Tire talc
Inner tube valve cores
Patches
Radiator cement
Generator brushes
Fuses
Bulbs
Grease cups
Oil cups
Pliers
Wire on spools
Assorted sizes of nuts and bolts
Cotter pins
Lock washers, etc.

All of these would be displayed in boxes. Pliers, for instance, frequently are lost on the road and tourists want a new pair.

Sell Tourist's Kits

The dealer might even get up a combination tourist's pasteboard carton, perhaps advertising this carton by a sign on the service case, which might read something like this:

ASK ABOUT OUR TOURIST'S REPAIR CASE

The tool tray in the bottom is to keep the tools together. It should contain articles such as wrenches, hammer, grease gun, pliers and screwdrivers in assorted sizes so small screws on distributers and magneto breakers can be reached.

The tool tray is made of ¾ in. material. The corners of the portable service case are made with 2 by 2 in. posts that run up to the guides for the tray. The posts are fitted with castors, not the swinging kind but those running in one direction only, so the case will not roll off the curb. It might be well to make small depressions in the cement walk at the curb so the castors will sink into them and thus anchor the outfit. A dealer, who handles some particular make of car, might fill the case with such special articles which his experience has taught him wear or break more frequently on that model.

Another good idea is that it would pay to lay in a stock of celluloid and a second-hand sewing machine to repair broken rear curtain lights. Also keep on hand the glass kind, which many prefer now.

Have a Service Car

Many dealers already have on hand used cars, one of which would make a good service car or truck. This will be needed to tow in breakdowns and might be arranged so it can carry an extra wheel, tires or other spares so the disabled car can be fixed on the spot, assuming the dealer is to render service on a particular make and therefore can stock up the service car with parts which he knows will fit.

Some of the things which you should look to in general when getting ready for touring season are:

Tire stock
Vulcanizing facilities
Storage room
Waiting rooms, etc.

Garages on the transcontinental highways, in particular, can depend on a steady call for overnight storage. In advertising, on signboards or otherwise, it would be a good thing to call attention to the fact that your storage space permits of this class of service. Then tires are always in demand. A tourist, especially on a long trip, rarely if ever is able to take all his tire equipment with him, and he almost always wants to pass the worst vulcanizing jobs over to some repairshop fitted for that work.

Tire Gauges, Chains, Etc.

Besides the opportunities for accessory and parts sales, there are possibilities in the following:

Tools for roadside repairs
Overalls or jumpers
Radiator thermometers
Collapsible water pail
Camping equipment
Goggles
Spotlights
Windshield cleaners
Tire tester
Battery tester
Chains

The list might go on much further. Your sales will depend on calls for that special accessory or part or—and here is the point—suggestions from the dealer or garageman. If the tourist expects to make roadside repairs, for instance, suggestions as to tools for those repairs, overalls, etc., are in order. For an overheating engine, a radiator thermometer is the suggestion. You can tell, of course, whether the tourist already has had his goggle needs filled. But there is nearly always an opening here. Many break the goggles once they have started and want more; others forget them in outfitting themselves for a trip.

It would be impossible here to consider all the accessories and so on a dealer or garageman might have in stock as preparatory to the touring season. But if these are of any assistance in helping the dealer or garageman cash in on touring, as they should be, then so much to the good. The ideas contained in the preceding article on cashing in on touring and those in this article interlock, and it would be well to consider the one along with the other.

Remember, a clean service station, exterior and interior, is an inducement for the tourist to stop there.

Perhaps you have a good electric sign on your building already, but if you have not and do not care to go to the expense of having one made up in the usual manner, we offer herewith two suggestions for an easily made sign. Both are quite satisfactory aside from the initial saving in price.

The T-shaped sign is nothing more than a plain board sign lettered and illuminated on both sides, the lights being protected from the elements and partially concealed from view by the T-shaped top. The space around the lights should be painted white to reflect all the light. The other sign might be termed a box sign. Each side is glass, and the top, bottom and ends are wood. Lights are placed inside, top and bottom, and access to them is gained through a hinged door in each end. The glass may be painted to suit, or colored paper shellacked to the inside may be used.

Speaking of signs, don't make the mistake of cluttering up the interior or exterior of your place with a lot of poorly gotten up or misleading signs. If you have any old posters advertising last year's motor car race at the county fair, the remnants of out-of-date calendars, etc., set aside a few minutes of your time and have a general house-cleaning. Your customers will see these old signs and consider you way out of date, and you may even get the reputation that your way of doing business and rendering service is anything but up-to-date. If you must have posters and calendars, let them be right up to the minute, so that when a tourist leaves your place and glances at the calendar he gets what he is looking for. These are small matters in themselves, but attention to them collectively means a better way of cashing in on trade.

Watch Your Signs

If you moved into a building not originally intended to be a garage, by all means inspect the exterior for misleading signs. We recently saw a dealer's place where a sign, "Restaurant," had not been removed from the front of the building. It extended out about 8 ft. across the sidewalk, and would have required the removal of but six lag screws. Get rid of all things entirely foreign to your business.

Have you ever thought of cashing in on your tourist trade by selling them photo supplies, principally films? Most tourists carry a camera, and it is a pretty safe bet that most of them use films of the postal card size, 3¼ by 5½ in. These come in six and ten exposures. Lay in a few dozen of them, with perhaps a few of other sizes, like 3¼ by 4¼, and put up a neat sign something like this: "Do You Need Films? We Have Them." Then watch the results.

THEY'LL COME IN BROWN BOTTLES

Milwaukee, Wis., May 9—As a short but sweet answer to the oft asked question, "What will become of the brewery workers when prohibition arrives," comes the announcement that a prominent Milwaukee motorcycle manufacturer has secured on a long time lease part of the famous Pabst brewery to be used for the manufacture of motorcycles. In the same plant where formerly about 150 brewery workers were employed between 300 and 400 highly skilled men will be employed in the manufacture of motorcycles.

Tire Prices Are Dropping

15 Per Cent Reduction by Six Big Makers

Other Rubber Factories Expected to Follow

NEW YORK, May 12—A not altogether unexpected reduction in tire prices becomes effective to-day in the case of a number of the large makers, and it is likely that practically all manufacturers will fall in line before the end of the week. The reduction amounts to approximately 15 per cent.

Late last week, rumors of an forthcoming cut became persistent. Tire makers, however, stated that no change in schedules would be made in the immediate future and a number of them even went so far as to present reasons why a revision upward was more likely than a revision downward. Despite this the reduction has been quite general. It is expected that the new prices will hold for several months. Following are new and old prices of those companies that have made reductions, and comments of others regarding the situation:

United States—Will be reduced approximately 15 per cent on all brands except the USCO, which will be reduced about 13 per cent. There will be slight fluctuations in these reductions throughout the list where manufacturing costs are higher or lower in certain sizes.

Republic—There will be a conference at the factory some time today to consider the matter.

Braender—Reductions will be made, but lists have not been made up yet.

Carlisle—No reduction.

Ajax—Will undoubtedly meet the reduction. No lists made or decision reached yet.

Empire—Not heard definitely yet from the factory.

Hood—At present holding up billing in expectation of a drop of 10 to 15 per cent.

McGraw—No change made as yet; no word from factory.

Michelin—Probably will be a drop of approximately 15 per cent today.

Portage—No word yet and nothing will be known for 2 or 3 days.

Thermoid—May or may not be a revision of the list; not decided yet.

Pennsylvania—Lists and trade prices will be reduced 15 per cent.

Fisk—Not heard definitely yet from factory; assume prices will drop about 15 per cent.

Kelly-Springfield—At present engaged in working out new prices; no information as to extent of drop available.

Lee—In conference on the subject of prices. Result will not be known until late today or possibly tomorrow.

On the 34 by 4 size, which is typical, Goodrich plain fabric tires have dropped from $32.95 to $28.10 and ribbed cords from $52.75 to $47.20.

On the same size tire Goodyear plain has dropped from $34.30 to $28.10 and the non-skid from $40.10 to $34.10.

Firestone prices on the 34 by 4 plain tire are now $28.10 instead of $34 and on the cord non-skid are $47.20 instead of $55.50.

OPENS VACUUM QUESTION

Chicago, May 10—The patent situation on vacuum tank methods of fuel feed made another step toward final solution when the Court of Appeals, April 30, upheld the previous decision of the United States District Court that the Thermo-Vacuum system based on Fred Weinberg's patents does not infringe the Webb-Jay patent on which the Stewart-Warner tank is built.

While directly affecting only the situation as between Stewart-Warner and the Thermo system, it also indirectly may influence the final decision on the appeal of Stewart-Warner from the decision of Judge Westenhaver last winter, which held that the Sparton tank, manufactured by the Sparks-Withington Co., infringes the Stewart-Warner patents only on two points of a series claimed.

After Judge Sanborn handed down his decision, April 20, 1918, in the United States District Court, holding that the Thermo-Vacuum system brought out by Fred Weinberg of Detroit was not an infringement on the Webb-Jay patents under which Stewart-Warner is licensed to manufacture the Stewart-Warner vacuum tank, Stewart-Warner appealed the case in the District Court of Appeals, and April 30, 1919, in this court, Judge Baker affirmed the decision of Judge Sanborn.

This court held that pumping a liquid, either gasoline or water, was an old process, and that while the Stewart-Warner patents were valid, the Weinberg tank was not an infringement, as in both devices the whole apparatus combined with the engine was broadly a pump.

NO CHANGE IN OVERLAND STRIKE

Toledo, O., May 9—The labor difficulties at the Willys-Overland plant, announced last week in MOTOR AGE, has curtailed the output of the factory.

The International Machinists' Union called a strike at Willys-Overland Co. at 3:30 Monday afternoon. Approximately 6,000 machinists quit at that hour, refusing to work until 4:06 o'clock, the closing hour decided upon by the company. The strikers picketed the factory and declared they will resist to the utmost the effort to put a 48-hour working week into effect. There has been no rioting. Production has been badly curtailed and in some departments is at a standstill.

C. A. Earl, vice-president and general manager of the Willys-Overland Co., said:

"We are going to stand by the interests of the great mass of our employes. We are not going to let the radicals run this business. We have been trying for six weeks to reach an agreement with the union. Every attempt has failed. This matter had to come to a head sooner or later, and it is probably just as well that it be settled now as later. We are going ahead at any cost."

K-W WINS LOCK RIGHTS

New York, May 9—The K-W Ignition Co., Cleveland, has won its suit against the Goodrich-Lenhart Co. for infringement of certain patents on ignition locks. The United States District Court for the eastern district of Pennsylvania has held that patents Nos. 841,844 (Burnet), 1,015,300 (Cox) and 1,253,470 (Cox) under which the K-W Ignition lock switches are made are valid and infringed by lock switches made by the Goodrich-Lenhart Co. The latter company has paid certain damages to the K-W Co. and is allowed to dispose of a comparatively small quantity of lock switches which it now has on hand.

STUDEBAKER IN ANOTHER DIVIDEND

South Bend, Ind., May 9—The board of directors of the Studebaker corporation today declared dividends of 1¾ per cent on preferred stock and 1 per cent on common stock.

Detroit Needs Mechanics

Motor City Short on Engine Experts and Repairmen

Dealers Say Return of Men Vital to Service

DETROIT, May 12—There is a great shortage of motor mechanics and repairmen in Detroit service stations. Over a year ago, when the draft took thousands of young men from Detroit automotive factories and garages and sent them overseas the industry managed to weather the shortage due to curtailment of car manufacture. Part of the 85th division is home again and hundreds of experts have returned to their trades but there is still such a great shortage of skilled automotive mechanics that garage dealers on all sides are clamoring for experienced men.

It is very possible that the immediate future will find the Detroit Automobile Dealers' Association behind an organized movement to get the Government grant immediate release to all Detroit motor experts still in the army. It is estimated that there are several thousand still in uniform. Right at present it is estimated that there are over 1000 jobs here for garage men alone. The scarcity applies not only to skilled men but to helpers and washers. One of the biggest Woodward avenue distributors states his service station has been without the service of a single washer for 10 days without prospects of getting any.

The Automobile Dealers' Association is doing everything possible to alleviate conditions by advising the dealers and rounding up men but the situation is not likely t improve until the thousands that joined the motor corps from Michigan are brought home and demobilized. As the motor season advances conditions are going to grow worse, garage men declare, as the amount of business will show a great increase with the coming of summer weather.

The return of the men is vital at this stage, it is pointed out to avert a "jam" of cars and trucks out of commission through lack of repair facilities, which would mean a serious halt to otherwise prosperous business activity. What applies to cars and trucks is true likewise of tires and accessory repair departments which employed hundreds of skilled operators up to the time the war took them away.

START SAFETY FIRST MOVE

Chicago, May 9—A nation-wide campaign to make the country realize the need of safety first traffic regulations, particularly in cities, is being launched by the highways transport committee of the Council of National Defense.

Hundreds of authorities have been asked to take part in the movement, including all the national traffic associations, state highway engineers, many chiefs of police, governors, secretaries of state, and other officials who have to do with traffic problems in one way or another.

As a first step a series of regulations have been drawn up which summarize the best thought of the country on the subject of safety. These are to be placed before the various municipal governing bodies with urgent recommendations for their adoption in one form or another.

At the same time, hundreds of thousands of safety bulletins will be distributed broadcast through the aid of volunteer local organizations.

Guarding the children on the streets is the most difficult task faced by the safety first campaigners, and it is in this direction that their greatest efforts are to be directed.

SAXON TO ISSUE NEW STOCK

Detroit, May 12—The Saxon Motor Car Corp. will soon be operating under its new reorganization plan, which calls for the issuance of an entire new stock issue to be absorbed by the creditors and the cancellation of all present stock. The proposed plan, as outlined some time ago, was signed by all of the bankers and a majority of the creditors at a meeting in Cleveland Friday.

CAMPBELL IN RECEIVER'S HANDS

New York, May 12—The Campbell Motor Car Co., which emerged as the result of the reorganization of the Emerson Motors Co., Kingston, N. Y., in September, 1917, has been placed in the hands of a receiver. It is stated that the action is a friendly one, brought about largely through a shortage of ready cash, and that there is a strong probability that the company will be reorganized. In the meantime the receiver is to continue the business.

FORM NEW GUARANTY CO.

Detroit, May 9—The Motor Bankers Corp. is the name of a new company just organized here to finance retail sales of new and used cars and trucks, following in a general way the approved methods of other finance and guaranty companies.

The directorate of the new company includes Clarence H. Booth, formerly manager of the Studebaker Corp.; Alonzo P. Ewing, manager of the Michigan Copper & Brass Co.; Edward A. Loveley, of Stormfeltz and Loveley; Harvey B. Wallace, of the Trueing Wheel Tool Co.; Luman W. Goodenough, attorney, and Richard D. Ewing, recently discharged from the army as a captain in the office of the Secretary of War. The last named will act as active manager of the corporation.

NOW, SALISBURY AXLE CO., INC.

Jamestown, N. Y., May 9—The manufacture of motor car wheels has been discontinued and the firm name changed from the Salisbury Wheel & Axle Co. to the Salisbury Axle Co., Inc. The increased production of axles will be facilitated by added equipment and additional floor space.

WILLYS HEADS SHOW BODY

New York, May 9—The National Automobile Chamber of Commerce has appointed John N. Willys chairman of its show committee for the 1920 passenger car show. Other members of the committee are H. J. Root, of Westcott, and H. M. Jewett, of Paige. M. L. Pulcher, of Federal, heads the committee on the motor truck show.

Ford Plants to Dot World

Assembly Stations and Factories Planned in Foreign Countries

Expect to Produce Over Million Cars This Year

DETROIT, May 12—Ford will dot the world with plants when peace is signed. Immediate steps will be taken for the building of assembly plants and factories in many of the foreign nations. In the larger countries there will be factories and in the smaller countries, such as Denmark, Spain and Portugal, assembly plants with an average capacity of 100 per day. The assembly plants will be the first constructed and will become the clearing houses for the parts supplied to them from the Detroit and Manchester, England, factories.

Cadiz and Copenhagen have already been decided upon as cities where assembly plants will be erected, each to cost approximately $350,000, and by this system the Ford interest expect to be able to place on the European market at least half a million cars annually. It is but a question of weeks when the Paris and Bordeaux offices of the company will be reopened.

Ford officials will not deny that the present sites decided upon for tractor plants are Troy, N. Y., and Pennsgrove, N. J., and that the Troy plant will also manufacture the standard Ford.

At the Ford plant figures obtained shows that from April 28 to May 6 inclusive 21,761 cars were manufactured, being a daily average of 2,720. The actual number of unfilled orders April 20 was 80,283, which was increased to 88,528 on May 8.

Ford officials are confident that, beginning June 1, the daily average output of cars will be 4,000, a figure they are now striving for, and that the number for the present year will exceed 1,000,000. To produce this enormous output of cars requires the services of approximately 40,000 men.

WHITE LEAVES CADILLAC

Detroit, May 12—D. McCall White, vice-president and assistant general manager of the Cadillac Motor Car Co., has resigned his position with that company. His resignation is to take effect at once. Mr. White will not discuss his future plans. His statement, however, that he would remain in the automotive business and that his operations would be very extensive has given rise to much speculation here as to the possibility of a new automobile company, with Mr. White at the head.

Mr. White is a pioneer of the V-type, high-speed, high-efficiency engines which he designed for the Cadillac Motor Car Co. in 1914. He came to Detroit from Great Britain in 1914 after having filled high positions with several leading European firms.

REPUBLIC DEALERS ORGANIZE

Chicago, May 9—An association of Republic truck distributers has been formed and the first of the semi-annual meetings will be held in Chicago, June 2 and 3.

EDITORIAL

Revive Service Associations

CHICAGO'S service managers have permitted their organization to expire without a protest. Undoubtedly the army's need of skilled executives played havoc with the active membership of many such organizations as the Chicago Service Managers' Association, yet other organizations were affected similarly and are now very much alive. It can be said truthfully that the state of affairs at present is such that reviving the Chicago organization would be to the credit of the guiding spirits of the old association and to the benefit of the industry as a whole. The time has come to revive it.

IT must be revived. In its brief career it accomplished excellent work. Many service managers were benefited by the exchange of ideas at its meetings. No company is beyond having its service bettered. The work to be done cannot be accomplished by an individual. While one may contribute much towards the cause, it will require the combined efforts of many to establish service on the basis where it belongs. A real live institution with big ideas is needed. IT HAS NATIONAL POSSIBILITIES. The foundations of the old association are still standing. Get together and reorganize. LET'S GO.

Used Cars an Asset

THE present shortage of new cars naturally enough is reflected in an increased demand for used cars in good condition. This demand for vehicles which have seen service is certain to decrease as the production of new cars approaches an equality with the requirements. Just when this balance will arrive it is impossible to predict, but it is a certainty. It is likewise a certainty that at some date, after a period of months, the used vehicles which have been turned in on new cars will not command the prices that they do now.

THIS is the time for the wide-awake dealer to plan for that future period of possible stagnation in the used car market. A very large proportion of the used cars are mechanically as good as new or can be made so with a comparatively small outlay. But even in mechanically perfect condition they will not find a ready market because out-of-date bodies proclaim their vintage in tones that hurt the pride of the prospective owner.

MANY purchasers of low-priced new cars would prefer to put the same amount of money into a good used car of originally higher price were it not for its out-of-date lines. A new body of modern appearance, new top and new finish frequently will make of a car which was before decidedly second-hand a vehicle with a direct appeal to the fastidious on account of its distinctiveness and which will bring a price which will repay the effort many times.

Tractor Plants in the South

NOW that the more immediate task of making tractors generally known in the South has been given a remarkable start by the Dixie National demonstration, we believe tractor manufacturers would do well to consider seriously the location of subsidiary plants in as yet almost untouched fields of the Southeast. A new era has opened for this territory.

PROBABLY no better site could have been chosen for the Dixie demonstration than the city of Macon, Ga., and probably no better city could be selected for tractor plants than the city of Macon. Its strategic position in the heart of Georgia, or in fact, in the center of the South making the greatest strides in commercial and agricultural developments, makes it particularly well suited to the location of subsidiary tractor plants.

FIGURING the entire state of Georgia as a market, Macon is the exact geographical center, and the greatest number of farmers can be reached from it. There are eleven railroads radiating from Macon over which shipments can be made. Within a radius of 50 miles of Macon are 800,000 people.

MANUFACTURERS may argue that coal and iron are not as readily obtained here as in the northern manufacturing states, but against this the people of the South say it is even more important to have facility of distribution of the finished product than being literally at the mouth of the mines. These are close enough to make the freight reasonable, but beyond this is the fact that when tractors have been built they must go to the greatest number of farmers at minimum expense.

THIS part of the country is provided with ample power, while much of the raw material entering into the manufacture of tractors is at hand also. Within the next few years it is almost certain, under the impetus of good roads, better schools and a host of other improvements, the city of Macon will be a headliner and those manufacturers getting the initial hold will have a tremendous advantage.

Tax Law Interpreted

Treasury Department Calls Attention to Regulations

Dealer Must Watch His Step in Pricing Accessories

WASHINGTON, May 9—Regulations and interpretations of the income taxes as they apply to automotive products have been completed by the treasury department.

The rulings are not sufficiently complete to allow definite understanding of all of the problems that have come up in relation to the tax on automotive products. In some instances they are exceedingly vague, as for example, in the statement that if any doubt exists as to whether an accessory should be taxed, it will be determined by the fact that it is sold to a motor car accessories dealer by the manufacturer, which ruling is completely reversed by a statement following to the effect that a monkey wrench sold for general purposes is not subject to a tax.

On all such matters it will be necessary to secure definite special rulings from the treasury department. This, judging from the length of time taken to compile the present regulations, will occupy some few months and in the meantime it will be necessary for the manufacturers to pay the tax depending on a later ruling for securing credit for the taxes from the government. That a tax can be made more than once on the same commodity is shown in the case of the assembler of motor cars who buys chassis from one maker and bodies from another; each of the three producers have to pay a tax, although certain credits are allowed the assembler.

Where a car maker has an agency in which he has a financial interest in New York City, for example, he does not pay a tax on the cars delivered to that agency for sale until the agency makes the sale. The agency then pays the tax. This is apparently done because of the difficulties that would arise if a manufacturer shipped a number of passenger cars to one of his branch retail establishments and had to pay a tax on them whereas they have not been actually sold since the manufacturer owns the retail establishment.

The tax on the cars sold through the retail establishment of a manufacturer is based on the wholesale and not the retail price. The interpretation to the effect that trailers are not taxable excepting when they form a composite part of a truck is apparently meant to apply to those units which are attached to a chassis to form the truck.

Likewise the interpretation allowing for credit of taxes where rebates are made on quantity sales stretched over a period of time, is probably intended for such manufacturers as the Ford company which rebates its dealers after they have purchased a certain quantity of cars. The regulations regarding tractors do not specify farm tractors and apparently any tractor is not taxable regardless of whether it is intended for farm or other use.

Trade Press to Advise

Industry Has Say in Disposal of War Material

War Department Reiterates Market Not to Be Flooded

WASHINGTON, D. C., May 10—The general policies of the war department in the disposal of surplus property, were enunciated by C. W. Hare, director of sales, to a committee representing the trade and technical papers of the country, at a recent meeting in Washington.

Mr. Hare stated that the War Department would dispose of its surplus materials by first consulting with the various branches of the Government to ascertain what, if any, could be utilized in regular Government work. After the Government requirements have been satisfied, the producers of each particular commodity will be called into conference to advise with the director of sales

If, as has been the case in the disposal of copper, sulphur, lead, wool and lumber surplus stocks, the industry is able to contract with the Government to dispose of its surplus within a reasonable length of time, paying the Government the current market prices, it would be the policy of the Government to make such an arrangement.

A sales promotion section has been established under the supervision of T. R. Elcock, Jr., to collect all the information.

Important Features in the New Excise Tax Regulations

Tax is effective Feb. 25, 1919, regardless when car, truck or motorcycle was manufactured.

"Manufacturer" means producer or importer. "Sale" also means lease. "Person" also includes partnerships, corporations and associations.

Tax is on the actual sales price and not on the list price of the manufacturer.

If you include the tax on your sales price the tax must be computed on the increased price.

The tax is payable regardless if the commodity has or has not been paid for, once the sale is made.

Discounts for cash made subsequently to the sale cannot be deducted. When a rebate is made in return for a quantity purchase that extends over a period of time a deduction of the rebate is allowed to be made for the month when the final price is determined.

Commissions to agents or other costs of sale are not deductible.

Cars, trucks or motorcycles sold f. o. b. factory are not taxable for the freight charge even if paid by the manufacturer provided he is reimbursed by the purchaser.

Credit can be taken for taxes paid on cars, trucks or motorcycles if they are sold and returned. If any part is returned the credit must be based on the proportion of the price of the article returned as against the price of the complete commodity.

There can be several taxes on the same car or truck. A maker of a body pays a tax. A maker of a chassis pays a tax. The assembler of both pays a tax. However the assembler can credit himself with the amount of the tax imposed on the body and chassis makers when making his computation.

Where makers have agencies in which they have financial interest the agency pays the tax.

A tax applies when title of ownership passes from the seller to the buyer.

Automobiles sold by the maker and on which a tax has been paid are not taxable again unless returned and credited in the tax account.

Tractors when sold are not taxable even if sold in combination with trailers.

Tires, parts and accessories are taxable if sold to a dealer to repair second-hand cars.

If any doubt exists as to the taxability of an accessory it will be determined by the fact that it is sold by a manufacturer to an accessories dealer. However wrenches and such tools are not taxable if they are made for general use. They become taxable when by special design they are primarily adapted to automobile use.

Robes, goggles and lunch kits are not taxable.

Trailers are not taxable unless they are of that type that make the rear part of a car, or truck.

When parts are sold by a maker to a jobber and in turn to a producer of cars the manufacturer of the parts pays the tax.

Where a producer of raw materials sells them to a maker of parts or accessories and he in turn sells these to a maker of cars, trucks or motorcycles the manufacturer of the completed vehicle pays the only tax.

If a manufacturer is engaged in both wholesale and retail business he bases the tax on the wholesale prices when sold at wholesale and on the average wholesale price of the articles sold at retail.

There is no tax for cars, trucks or motorcycles sold for export provided they are exported within 6 months of the date of sale.

Drivers Tune up for Race

Resta-Sunbeam Combination the Favorites

Record-Breaking Crowds Expected

By Harlan C. Skinner
Motor Age Editorial Staff

INDIANAPOLIS, Ind., May 12—European drivers are out to win. This is the gist of opinion among them, and they are prepared to make a determined effort to carry away the major honors of America's premier speedway event, the 500-mile Liberty Sweepstakes, to be staged here May 31. Eleven cars of the total of forty-three entries are of foreign design and manufacture.

Greater activity commenced at the Speedway with the arrival of two cars of the Ballot team, in addition to the Sunbeams and Peugeots, which are already at the track being groomed for the coming event. René Thomas and Albert Guyot will pilot the two Ballots, now here, and the other two, to be driven by Louis Wagner and Jules Bablot, are expected from New York in a few days.

The Ballot team is a formidable combination, as the cars were designed by Wenny, former Peugeot engineer, who has made a careful study of the conditions here and produced these cars solely for this event.

Prevailing opinion at present is that Dario Resta and his new Sunbeam will be the ruling favorite. The two Sunbeams are new creations of Coatalen, chief engineer of the Sunbeam Co., and are based on the experience gained in previous Indianapolis races. They are also designed with the same objective in view, as the Ballot but follow the usual Sunbeam practice of using a six-cylinder power plant. This will probably be Resta's last appearance at the wheel of a racing car, as he has taken on the Sunbeam agency and will shortly open offices in New York. It is not known at this time whether or not the Sunbeams will remain in this country for further racing.

Duesenberg has two new eight-cylinder cars entered, to be driven by Edward O'Donnell and Thomas Milton. They have not arrived as yet, but rumor has it that they made a remarkable showing in their initial tryouts and that they would give the foreign entries a hard race. Jules Goux is busy preparing his Peugeot and has had it out on the track for a number of days. None of the drivers have tried to exhibit any speed as yet, but are familiarizing themselves with track conditions. Ralph De Palma is expected with the Packard the latter part of the week.

The advance sale of seats is much heavier than for any of the six previous races, and a record-breaking crowd is expected.

UNIONTOWN ENTRIES COMPLETE

New York, May 12—The opening event for the year on American speedways will be the 112-mile race on the Uniontown speedway on Saturday. A good many of the racers will go from there to Indianapolis to take part in the 500-mile race on May 31. Gaston Chevrolet is entered for both Uniontown and Indianapolis if he is reinstated by the American Automobile Association by that time. If not some other driver will have to be chosen for his Frontenac special. The sixteen following names are entered for the race at Uniontown:

DRIVER	CAR
Louis Lecocq	Roamer special
Kurt Hitke	Roamer special
Eddie Pullen	Hudson special
Cliff Durant	Chevrolet special
Harold Simmons	Hudson special
Wilbur D'Alene	Duesenberg special
Denny Hickey	Stickel special
Ray Howard	Peugeot special
P. W. Monahan	Johnson special
Joseph Boyer	Frontenac special
Louis Chevrolet	Frontenac special
Gaston Chevrolet,	Frontenac special
Tommy Milton	Duesenberg special
Ralph Mulford	Frontenac special
Fred McCarthy	Hudson special
Eddie Hearne	Durant special

Mr. Ballot, builder of the Ballot Special, is seen standing between the two cars. Note the large wheels, the largest ever used at Indianapolis

Ballot Eights Very Fast

French Racers Designed for Indianapolis

Cars Constructed in 102 Days

By W. F. Bradley
Motor Age Correspondent

PARIS, April 24—The four special Ballot cars entered for the Indianapolis race and to be driven by René Thomas, J. Bablot, Albert Guyot and Louis Wagner, are new productions, built in Paris entirely at the Ballot establishment with Indianapolis track conditions specially in view.

The cars have eight vertical cylinders in line, and consist of two castings of four. The bore and stroke is 2.9 by 5.5 in. There are four valves per cylinder mounted in the head and operated by means of two camshafts driven by a train of gears contained within an aluminum housing at the front of the engine. The crankshaft is built up in four parts and is carried in ball bearings. I-section connecting rods and aluminum pistons are employed. The engines have a single plug per cylinder and only one magneto. There are two Claudel carbureters per engine.

Details of Eights

The engine, clutch and gearbox are mounted on a subframe which is attached to the main frame by three-point suspension, so that there is no misalignment no matter how much the main frame members are twisted. There are four speeds and reverse. Drive is taken through the springs, which are semi-elliptic underslung type. Front springs are also underslung. The center of gravity of these cars is exceptionally low. With 80 by 120 mm. wheels and tires (practically 34 in.) the top of the radiator is only 40 in. from the ground. No special attempt has been made at stream lining and the cars will be run without a tail.

Whilst exact figures regarding speed are not available for publication, it may be stated that these cars are the fastest 300 cu.-in. mounts ever produced in France. They will be particularly dangerous, however, on track work, by reason of their rapid acceleration. All previous French cars sent to Indianapolis have been road-racing machines built for the long straight-away stretches of French roads.

When the Ballot company undertook the c nstruction of these machines it was guided by the experience of René Thomas, who decided that Indianapolis called for a very l center of gravity, good balance and suspension to reduce tire wear, and exceptionally rapid pick-up. The wheel diameters are the biggest ever used on Indianapolis track and the cars are the lowest ever seen in America. The final gear ratio has been laid out with the nature of the track in view.

There appears to be no doubt that these rs will be able to tackle the four turns per lap at a much higher speed than any of the others, and it is believed that their

powerful pick-up on coming out of the turns will give them an exceptionally high speed on the two straight stretches.

The building of these four cars constitutes a record in the history of the industry of France, if not of the world. Immediately after the armistice was signed, the writer approached the leading European manufacturers with a view to securing their participation in the Indianapolis race. Some of these firms had decided to race after the war; two of them had cars built, one had an engine partly completed, and one had drawings well in hand.

In order to reach Indianapolis on time it was necessary to ship the cars from Paris not later than April 26. This meant that there were 120 clear days, including Sundays and holidays, in which to design, build, assemble, test, and pack a set of special racing cars. No set of racing cars had ever previously been built in France in less than 12 months, and even this time was considered short. It must be remembered that although the fighting was over, a state of war existed in France, labor was scarce, material hard to procure, and transportation in an impossible condition.

Cars Made in 102 Days

On Dec. 27 the first work was done in the secret drawing office of the Ballot racing establishment. Before making this change the men had been working full time; during the first month each draftsman nearly tripled his working hours. No man left the building except to take meals.

The first real difficulties were experienced when crankshafts were ordered. Two sets of five forgings were bought outside and had to be scrapped. Finally it was decided that the Ballot company should forge and heat treat its own shafts, and in view of the difficulties which had been met, a test piece was taken from every individual bar, and every bolt and nut which went into the car was subjected to the Brinnel hardness test.

On April 7, the first Ballot racing car was run in the yard. It had been designed and produced in 102 days, including Sundays.

Cars Shipped by Trucks

Shipping space was secured aboard the French liner Savoie, sailing from Havre on April 26, but the railroad service between Paris and the port was so unreliable that on April 24 the boxed cars were loaded on motor car trucks and sent to Havre by road.

The Ballot team has as its manager Mr. Joe Origet, an American sportsman of French parentage, who claims the distinction of having first introduced American baseball into France. René Thomas, the captain of the team, is known to the American public as winner of the 1914 race. He is bringing with him his former mechanic, Albert Laly. After holding the end of the hot exhaust pipe of the winning Delage for two hours, Laly returned to France in 1914, took part in the French Grand Prix race at Lyons, and two weeks later was a soldier in the war against Germany. Before the end of August Laly was a prisoner of war in Germany, having been captured during one of the French attacks in Alsace.

Rickenbacker to Be Referee of Race—Colonel Vincent Will Set Pace for Flying Start

INDIANAPOLIS, Ind., May 13—Capt. E. V. Rickenbacker, America's Ace of Aces, has accepted the invitation extended him by the Indianapolis Motor Speedway to act as referee in the 500-mile Liberty Sweepstakes, May 31, and is expected to prove a big drawing card for that event. The last time Captain Rickenbacker appeared on the Indianapolis course it was in the role of driver, heading the Maxwell team campaigned by the Indianapolis speedway. Since then he has become a world figure through his exploits in downing 26 Hun planes.

Since his release from active duty, Captain Rickenbacker has been lecturing almost nightly in large cities throughout the United States on his experiences in France.

Lieut.-Col. Jesse G. Vincent, vice-president of engineers of the Packard Motor Car Co., and one of the principal designers of the Liberty engine, has been invited by the Indianapolis Motor Speedway Company to set the pace for the thirty-three racing drivers in the flying start of the Liberty Classic.

Patterson Is Starter

E. C. Patterson, of Chicago, noted sportsman and holder of the cross-country record between New York and Chicago, has been selected to wave the checkered flag for the winner of the international 500-mile Liberty Sweepstakes at Indianapolis, Ind., May 31.

Patterson has been identified with the speed sport for many years, and on three occasions was an entrant in the Indianapolis event, bringing over Theodore Pilette to drive a Knight-motor Mercedes in 191 , and backing Ralph de Palma in 1914 and 1915. Pilette rewarded Patterson's efforts by finishing fifth in the five-century grind, and de Palma crowned his career as a "speed angel" by capturing first place two years later.

As his assistant in the Indianapolis event, Patterson will have W. S. Gilbreath, noted good roads advocate and popular manager of the Detroit Automobile Club.

Fifty thousand dollars is the total prize money offered, the largest purse to be awarded in any speed contest this year, and equaled only by past 500-mile classics.

The purse will be divided as follows: first, $20,000; second, $10,000; third, $5,000; fourth, $3,500; fifth, $3,000; sixth, $2,200; seventh, $1,800; eighth, $1,600; ninth, $1,500; and tenth, $1,400.

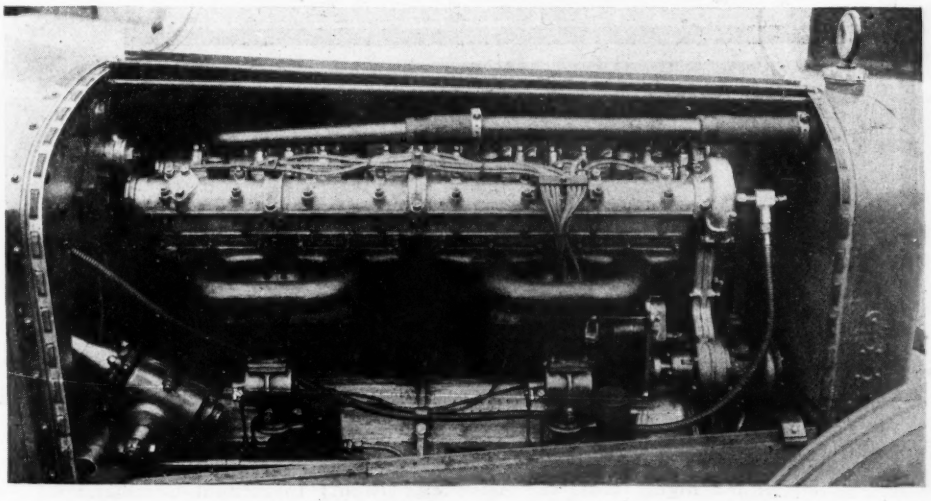
René Thomas and Albert Guyot, winners of first and third places in the Indianapolis 1914 500-mile race, respectively, have arrived from France, forming the vanguard of the Ballot team that will champion the tricolor in that historic event. Louis Wagner and Jules Bablot, remaining members of the Ballot combination, are following hard on the heels of their confreres, having sailed from Havre on May 3rd with the expectation of arriving on the scene of the fray on or about the middle of the month.

Resta Checks In

Another European star to check in for the big classic is Dario Resta, winner of the 1916 Indianapolis race and victor in the A. A. A. driving championship that year, who arrived with Louis Coatalen, chief designer of Sunbeam cars and aviation motors, the latter hailing from Wolverhampton, England. Resta will team with Jean Chassagne at the wheel of a pair of Sunbeams in the Indianapolis contest.

The only defenders of the Stars and Stripes who are now getting into shape at the speedway are Howard Wilcox, who, however, has as yet not entered the event and therefore cannot be classed as competition, and Elmer T. Shannon, who will campaign in the 500-miler at the wheel of a Mesaba Special. Shannon vaulted into the arena from Chisholm, Minn., bringing with him a car that derived its name from the celebrated range of iron ore near Shannon's home. No trace of iron enters into the car's composition, however, as it is in reality a Duesenberg, formerly raced under the name of Duluth Special at Chicago and other important meets.

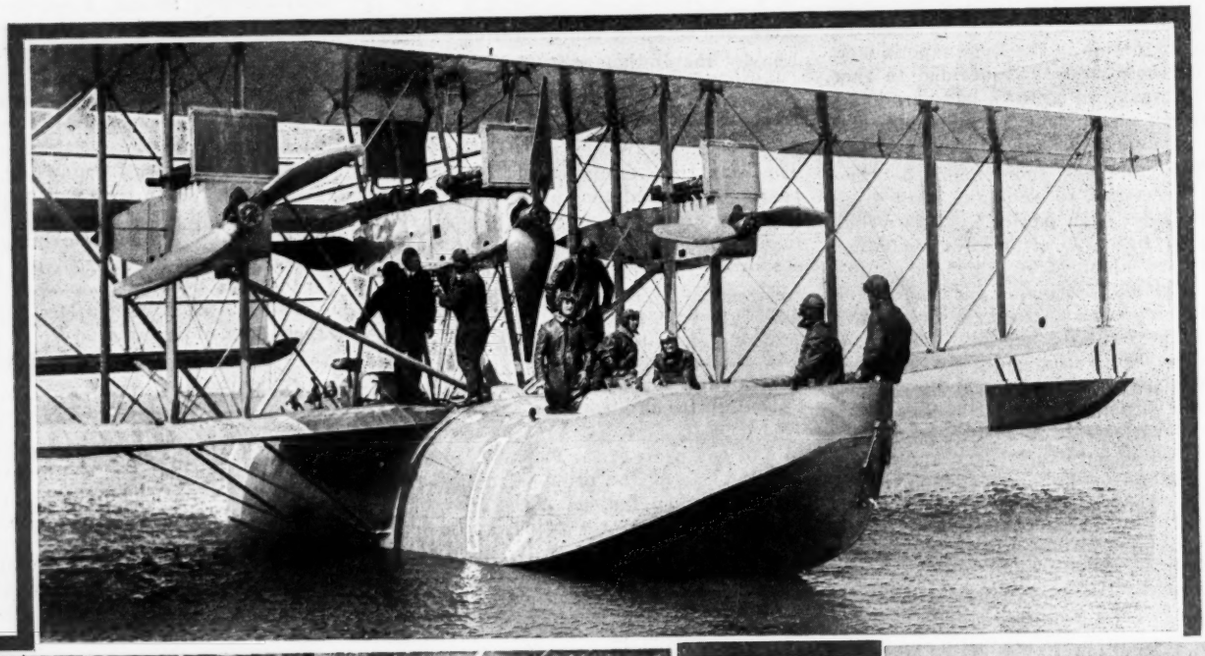
Shannon is a newcomer to the Indianapolis track, however, he enjoys an excellent reputation in the Northwest, having won several road and dirt track races of interstate prominence.

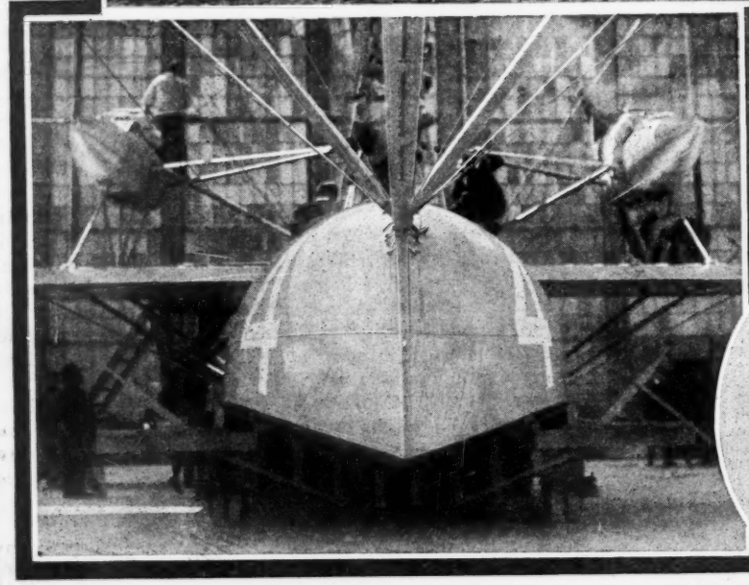


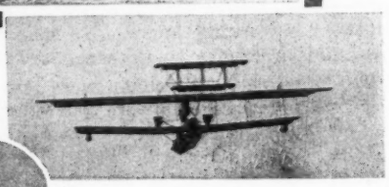
The eight-cylinder Ballot engine has two carbureters and one magneto. There are two overhead camshafts, gear driven

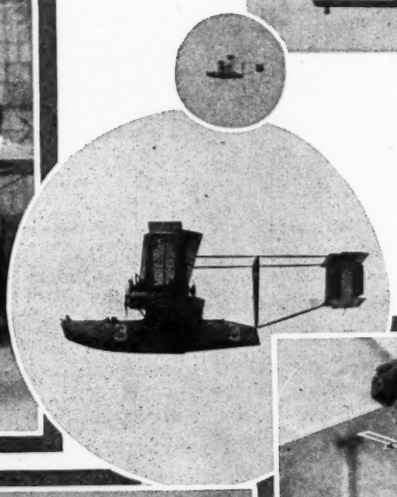
Close-up of America's Bids in Ocean Air Race

Navy Seaplanes, N-C1, N-C 3, and N-C 4, Are Ready for the Supreme Endurance Test. Trepassey, Point of Final Hop-Off

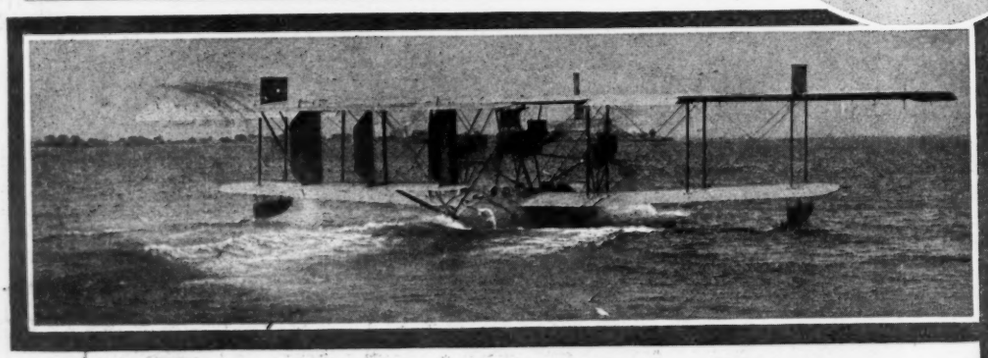


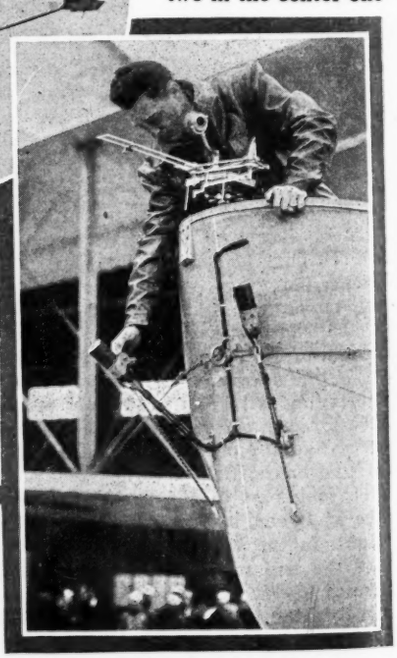






N-C 1 and crew in flying uniform aboard their seaplane preparatory to trial flight. These planes have four Liberty engines, one in each outboard cabin and two in the center one





The N-C 3 in a test flight. This craft with the N-C 1 is at Trepassey and they are waiting for the N-C 4. The trio will then start the second lap of the flight across the Atlantic. (Right) Lieutenant Commander Byrd adjusting the flares, used to light up the vicinity when landing at night. The wing spread of the N-C planes is about three times that of the British planes, the Martinsyde and Sapwith

The British Martinsyde plane in which Capt. W. Morgan, R.N. R. A. F., will attempt his flight from St. Johns, N. F., as soon as weather conditions permit. This plane was the last one on the scene, arriving weeks after the Sopwith plane, but was ready for the trial before any of the others

Ocean Flight to Europe Increases American Interest in Aviation

Chances of Success of U. S. and British Planes Compared

THE transoceanic flight has resolved itself into a race between the United States N. C. planes and the English Sopwith and Martinside planes. Our planes have already started their flight, but since the course the planes are following is composed of a number of comparative short flights, the planes have not as yet left the North American continent.

The speeifications of our planes follow:

SPECIFICATIONS OF THE U. S. SEAPLANES

Type—Tractor Biplane, with an operating crew of six men.
Engines—Four Liberty twelve-cylinder engines.
Wings—Upper wing span 126 ft., lower, 94 ft.
Hull—50 ft. long., overall length, 68 ft. 3½ in.
Height—Kiel to wireless antennae, 25 ft..
Wing Area—2380 sq. ft.
Gross Load—28,000 lb.
Draft—31 in.
Fuel Capacity—2000 gal. gasoline, oil 170 gal.
Speed—90 m.p.h.

Detailed information of the British planes is not available, but we do know that the line of flight that the British airmen will attempt ventures great risk to the lives of the airmen. Handley Page, the British airplane builder, has one of his machines entered in the great attempt. The other two British machines are the Martinsyde and the Sopwith. In each of these three crafts, we see that the intention is to complete the flight when once started for neither of the three is equipped with landing pontoons, and must therefore fly from land to land. Should it prove necessary for the airmen to alight, the only chance for salvation is that a ship be on hand to pick the men up, otherwise, ——.

The U. S. seaplanes are not of such delicate design, and finely worked out details as is in evidence in the British planes, but nevertheless our planes have a greater radius of action. They can carry more fuel, and are equipped with every possible means that will enable communication to be carried on. In the British planes much of this completeness has been done away with, in order to reduce weight and permit of more gasoline-carrying capacity.

In brief, the problem presents itself as a condition of speed and ideal engine operation against slower speed, but with more than the offsetting advantage of greater radius of flight and more fuel carrying capacity. Further, the British planes must of necessity fly from St. Johns, N. F., to Ireland, while our ships can tarry by the way and choose the route to the Azores.

N. Y. PERMITS AERO INSURANCE

Albany, N. Y., May 6—Three bills amending the state insurance laws to permit marine, fire and casualty insurance companies to insure against loss or damage to airplanes, seaplanes, dirigibles and other aircraft, have been signed by the governor. He also signed the Booth bill requiring motor trucks operating on state highways to be equipped with mirrors or some reflecting device giving drivers a view of the road in the rear.

Heads of Motor Cars and Planes Plan for Commercial Aircraft

DAYTON, Ohio, May 10—Leading representatives of the motor car and airplane producing companies throughout the United States were in conference here on May 9, with a number of distinguished government officials of the aircraft department.

The purpose of the meeting was to coordinate the ideas of the professional end of the aircraft department with the business end of both the motor car and aircraft producing industries of the country. The conference was held in order to discuss and determine the practicability of the airplane in the industrial world and put behind the airplane producing industry sufficient momentum to give its definite status.

Among those in attendance at the conference were: Lieut.-Col. H. B. Joy, formerly with the U. S. Air Service and vice-president of the Packard company; Alvin McCauley, president of the Packard company; Henry M. Leland, president of the Lincoln Motor Car Co., and representative of the Ford and General Motors companies; Glen Martin, president of the Glen Mar-

A British contender, Capt. Harry Hawker, in his Sopwith plane at St. Johns, N. F., ready to take to the air, awaiting favorable weather

tin Co.; A. W. Flint, president, and other representatives of the L. W. F.; Thomas Morse, of the Airplane Corp.; Wright Martin, of the Aircraft Corp.; Lieut. H. H. Emmons, of the United States Navy; Col. C. G. Hall, in charge of the procurement in the regular army; Col. W. E. Gilmore, chief of the supply for the air service; Col. T. H. Bane, chief of the engineering department of the air service, and Dr. J. F. McClelland, of Yale University and stationed at McCook field in this city.

One of the Government representatives stated that those identified with the aircraft department of the United States Government want to secure information as to how to proceed in order to get proper equipment for the aircraft department along the best and most economical lines. He said that the manufacturers composing the aircraft production end of the government departments during the war, had retired from the service and the regular army officials were organizing to take hold where they left off and carry the industry along.

AIR PILOTS MUST BE LICENSED

Washington, May 9—All civilians who pilot aircraft, including seaplanes, airplanes and balloons must obtain licenses from the joint army and navy board of aeronautic cognizance. A heavy fine is attached to operation without license. Application can be made to Lt. A. J. Clayton, Building D, Sixth and B streets, Washington, D. C.

TRUCK PARTS SERVICE BY AIRPLANE

Wabash, Ind., May 9—The first regular use of aviation in commercial transport, was made a week ago when deliveries of repair parts for Service trucks were made by two airplanes, operated by the Service Motor Truck Co. The repair parts were ordered by wire by the Firestone Tire & Rubber Co., for the Service trucks operated by that company in Akron. The telegram was 12 min. in transit and 18 min. after it was received at the Service plant at Wabash, the first plane was on its way and the parts ordered were delivered in Akron, about 200 miles distant in 2 hrs. and 45 min.

The Service Motor Truck Co. has installed four Canadian JN 4 Planes to render quick service on their trucks. The planes are operated by trained army flyers, and it is expected that this quick service will be especially valuable. In addition to delivering Service truck parts, the company is organizing the Service Aviation Training and Transportation Co. to train aviators, arrange for passenger flights, make express delivery and stage exhibitions.

TO LIMIT VEHICLE WEIGHT

Bloomington, Ill., May 10—Central Illinois tractor and truck owners are not altogether satisfied with a bill introduced in the Illinois legislature, fixing a maximum weight of 16,000 pounds for cars or other motor vehicles on the new hard roads of the state.

20,000 Army Trucks for Road Work

Surplus War Vehicles Turned to Highway Building

WASHINGTON, May 9—Twenty thousand motor trucks are being turned over to the bureau of public roads, department of agriculture, by the war department, to be distributed to the various states to be used on road construction work. These trucks are a part of the 31,000 which were recently declared surplus by the army and this disposition of them particularly insures that there will be no trucks available for sale to the public or resale to the manufacturers. The post office department has requisitioned 7000 and it is expected that other government departments will absorb the remaining 4000.

The trucks turned over to the department of agriculture are valued at more than $45,000,000 and include 11,000 new and 9000 used, ranging from 2- to 5-ton capacity and all are in serviceable condition. The trucks are turned over under section 7, of the post office appropriation bill which authorizes requisition of surplus trucks by the various Government departments from the army. They must be used by the states on road construction under Federal aid for which $200,000,000 were appropriated in the same bill. The only charges the states will pay will be for loading and freight.

The trucks will be apportioned to states only upon request of the state highway departments on the basis of the requests received from the various states and in accordance with financial apportionments under the Federal aid law. Requirements of the law prohibit the distribution of any of these trucks to counties and individuals.

STUDY FREIGHT RATES FOR TRUCKS

Washington, May 9—A study of existing railroad freight rates and motor freight rates will be made by Capt. A. J. Stevens, assigned from the department of purchase, traffic and storage, war department, to the highways transport committee, national council of defense, for the purpose of fixing equitable and profitable rates by which motor trucks can haul commodities over rural routes. Existing rates, it is said, are neither equitable nor profitable, and many motor truck fleet owners are losing money in some instances and overcharging in others. It is to overcome these problems to establish motor truck rural express on a sound basis that this work is being undertaken.

STEVENS JOINS REX TOOL

Pontiac, Mich., May 13—Guy N. Stevens, assistant secretary of the Olympian Motors Co., has just resigned and been elected vice-president and treasurer of the Rex Tool & Machine Co., Pontiac. Mr. Stevens is also assistant secretary of the Power Truck & Tractor Co., Detroit.

SAN BERNARDINO HILL CLIMB

San Bernardino, Cal., May 10—The San Bernardino Rim of the World hill climb was held on April 24. The course covers a distance of 8 miles rising to an altitude of 4900 ft. The cars were run in two classes, four-cylinder cars in one class, and cars with sixes and eights in the other. Charles Basle in a Peerless 8 won the event in 18:00⅘ min., making a new record on this course. Furniss in an Apperson came in second in 19 min. 24⅗ sec., and a Studebaker driven by Parker in 22 min. 24 sec. was third.

Fuller in an Essex came in first of the 4-cylinder cars in 19 min. 4 sec. Chevrolets made second and third. Second place was won by Rober in 21 min. 14 sec., and third by Clem in 21 min. 20⅘ sec.

RED HEADS UNDER NEW HEAD

New York, May 10—The Red Head Spark Plug Corp. has been formed to take over the Red Head spark plug business, formerly operated by the Emil Grossman Corp. The new company has no connection with the old one. It will continue and enlarge the business. A new insulating plant has just been opened at Newtown, Pa.

FLANDERS LEAVES MAXWELL

Detroit, May 9—Walter E. Flanders, chairman of the board of directors of the Maxwell Motor Co., Inc., has advised the Maxwell company that he will not again contract with them July 31, but will retire from the management of their affairs. Mr. Flanders will not state just what his future plans are. It is understood, however, that shortly after finishing his duties at the Maxwell plant he will board his new pleasure yacht for a long cruise down the Atlantic coast through the Panama Canal for California. Mr. Flanders, it is said, has disposed of a large part of his property holdings in Michigan and Ohio. It has been said that he contemplates locating in California, where he will establish a factory to make a new automobile. That he will go into the automobile manufacturing business in California, Mr. Flanders denies.

LON SMITH GOES TO MID-WEST

Harvey, Ill., May 7—Lon R. Smith has resigned as sales manager of the Buda Co., manufacturers of engines, to take effect June 1, when he will become general sales and advertising manager of the Midwest Engine Co., Indianapolis, Ind.

Guy Wright, formerly assistant sales manager of the Buda Motor Co., Harvey, Ill., has been made sales manager.

MARSHALL FIELD STAGES SHOW

Chicago, May 13—That the motor car accessory department of large retail stores can conduct successful shows was amply demonstrated here last week when Marshall Field & Co. staged a tabloid motor car show which the company ranks among its most successful, both from the point of sales and general attendance.

Some twenty-four manufacturers of accessories as well as three car makers were

invited by the store management to put on displays of accessories for which Fields are representatives. Among the more pretentious exhibits was a cutaway Cadillac chassis, Cole Eight, shown with an elaborate display of camping paraphernalia and a Marmon 34 engine mounted on a pedestal. Competent lecturers were in charge of these exhibits. The laboratory methods of testing oil was shown, as well as the process of making tires.

Stewart-Warner had on hand its show apparatus for demonstrating the operation of the Stewart vacuum tank, while other displays included Hartford shock absorbers, Rayfield carbureters, Autoscope windshield cleaners, K. P. Universal rim, Monarch auto lock, Detroit tire pump, Ray socket wrenches, Lane jacks, Gordon seat covers, Jeavons spring leaf lubricators, Buell whistles and Sebring tires. A gigantic model of the A-C spark plug in action proved quite a drawing card.

PLANS TIRE FILLER WEEK

Chicago, May 9—The week from May 28 to June 3 has been set aside by the Essenkay Products Co. as Essenkay week for their dealers, distributors and users over the United States. Factory space has been doubled and the company anticipates largely increasing the output of tire filler at an early date.

WHITE CAPITAL INCREASED

Cleveland, May 13—An increase in the capital of the White Motor Co. from $16,000,000 to $20,000,000 was voted at the annual meeting of the company's stockholders. Its regular quarterly dividend of $1 per share was declared, payable June 30 to stockholders of record June 14. All directors and officers were re-elected.

GARDNER GOES TO GOTHAM

New York, May 13—Harry T. Gardner, for several years manager of the Syracuse Automobile Dealers' Association and the Syracuse show, has been engaged as manager of the Automobile Dealers' Association of New York City and he will take over the job Ma, 15.

WILMINGTON HAS TRADE BODY

Wilmington, Del., May 13—The Wilmington Automobile Association, formed primarily to promote the annual shows, is being replaced by the Wilmington Automobile Trade Association, which is in process of formation. This association will take in not only the motor men, but also the accessory dealers, each branch of the business incidentally being represented in the officers, who will be selected in a very short time.

Because of inability to obtain a suitable place, the show for this year had to be abandoned, but there will be one next year.

LEIGH MANAGES HACKETT PLANT

Grand Rapids, Mich., May 9—The Hackett Motor Car Co. is getting its new plant ready for the manufacture of cars and hopes to be in fair production by July 1. R. L. Leigh, who has been in the automobile manufacturing business for a number of years, has been signed by the directors as factory manager.

Silver Linings to These Clouds

Illinois Tractor Dealers Cash in on Spell of Rain

BLOOMINGTON, ILL., May 13—The incessant rain of April and opening weeks of May was converted into an asset by the central Illinois tractor dealers. Advertisements were run in the newspapers, referring to the long-continued downpour and the gloom among farmers over delayed plowing and seeding. It was pointed out that the only way to make up for the lost time was to substitute a tractor for the horses. It was shown that a tractor could speed up 3 days' work into one, does not get tired, windbroken or have sore shoulders, and can work as many hours in the day as one or more drivers can steer it. It was further maintained that the tractor is the only agency to give the weather a knockout blow. The campaign for business, as conducted along these lines, has been highly successful, and many farmers have invested who might have waited a year but for the backward season and their anxiety to get their seeding done with the minimum of delay. Thanks to power farming, central Illinois promises to have its corn, oats and wheat crop harvested on time.

FORDSON AGAIN PRODUCING

Detroit, May 12—The Fordson tractor plant at Dearborn is generally getting back into production again after a 15-day suspension of operations for inventory. While it may be two or three weeks before the company gets into full production, operations started this week with a fairly large force. The company found that it was overstocked with certain materials and, to bring conditions to a balance again, operations are being pushed in the overstocked departments and curtailed in those departments where conditions are normal. It will be several days before things adjust themselves.

FORDSONS SELL FAST IN IOWA

Des Moines, Ia., May 13—In spite of the rainiest April which the middle west has had in years, Fordson tractor sales are more than keeping up with the optimistic program which had been set for them at the opening of the present season. The Herring Motor Co., Fordson distributors for Iowa, South Dakota and Nebraska, sold 1,322 Fordsons during the month of April regardless of the weather conditions, and the sales for the first week of May show a decided increase over those of April.

TRACTOR DEMONSTRATION FOR DENVER

Denver, Colo., May 13—Denver will have a national tractor demonstration June 8-14, the civic and commercial association having agreed to underwrite preparation expenses. The Denver Tractor Club and the civic body's agricultural and livestock bureau will also co-operate toward the success of the enterprise.

A suitable tract of more than 2000 acres has been obtained near the city, and committees have been appointed to provide for an ample water supply, motor transportation for visitors between the end of the street car line and the exhibition field, highway improvements, traffic regulations, eating arrangements and other details.

President A. E. Hildebrand of the National Association of Tractor Manufacturers, who was here recently conferring with local promoters of the event, declared the present Denver layout the best he has seen in connection with tractor demonstrations anywhere.

I. H. C. BUYS P. & O. PLOWS CO.

Chicago, May 9—The International Harvester Co. has bought the entire business of the Parlin & Orlendorff Co., plow manufacturers, including the plant at Canton, Ill., which is one of the largest plow factories in the country. It has been in operation more than 75 years.

This purchase adds to the Harvester company's line the only fundamental agricultural implement it has not heretofore manufactured, and is significant in that the I. H. Co. now acquires a complete line of tractor plows which have been a feature of P. & O. production. The transfer will be made July 1 and includes the lease of the ten P. & O. branches, which will be operated in addition to the eighty-eight Harvester branch houses.

SQUARE TURN ELECTS

Norfolk, Nebr., May 9—Officers elected by the Square Turn Tractor Co. are R. Florian, president and general manager; G. S. Albaugh, vice-president; C. E. Burnham, vice-president; Willian G. Eppley, treasurer and secretary; F. E. Wilson, production manager; F. H. Squires, sales manager; A. J. Colwell, chief engineer.

NEW TRACTOR COMPANY FORMED

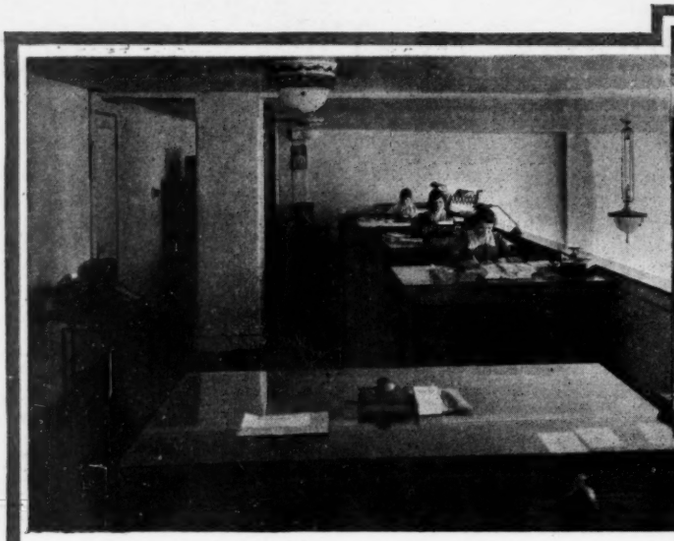
Evansville, Ind., May 6—A new company, capitalized at $1,000,000, has been formed for the manufacture of farm tractors. Robert C. and J. B. Graham, of Graham Bros., Inc., glass manufacturers, and Benjamin Bosse, president of the Bosse-World Furniture Co., are interested in the new concern. Besides a local plant it is planned to have a branch at Loogootee, Ind.

NOW IS CLETRAC TANK-TYPE

Cleveland, May 9—The Cleveland Tractor Co. has adopted the name, Cletrac, as the registered name of its tractor Tank-type-tractor is used in connection with the name as it is of crawler construction.

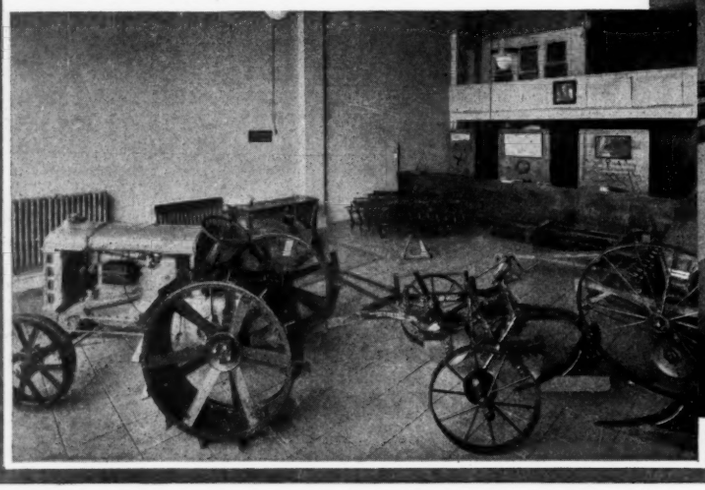
LIGHT COMPANY MOVES

Ludington, Mich., May 13—The Automatic Light Co., formerly of Minneapolis, Minn., is moving its offices to Ludington.

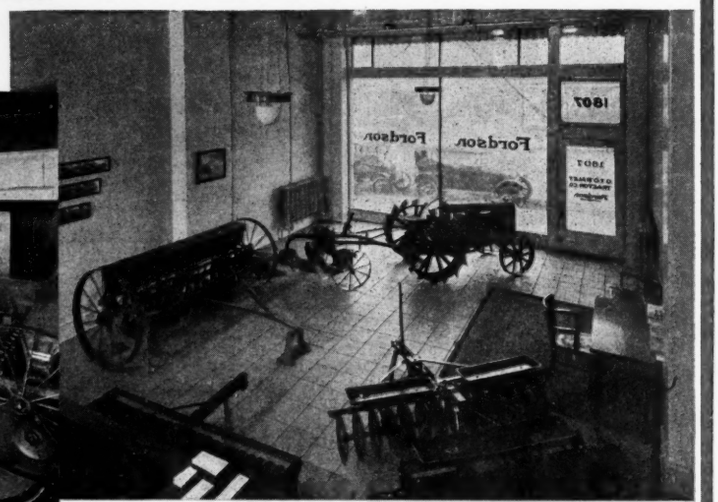


Efficiency is the keynote of O'Maley's office

Office view, showing simplicity of layout



Tractor salesroom, showing display of parts



General view of the tractor salesroom

A Motto of Cleanliness in Repairs

This Service Station Believes as a Man Is So Will His Work Be and Its Mechanics Are Among the Best

By B. M. Ikert
Motor Age Editorial Staff

"KEEP clean and your work naturally will follow the same channels" is the slogan hung on the wall in O'Maley's Kansas City service station. O'Maley handles the Ford car and Fordson tractor. You have only to spend about 1 min. in his place and you will see everyone in the concern lives up to the slogan.

Not only is the building itself inviting but there is an atmosphere in the repairshop, parts department, in fact, any department of the business that makes you feel you are getting service on a golden platter.

The building has been planned and fitted out to give as nearly perfect service as possible, coupled with minimum effort. The repairshop is fitted with machinery that insures absolutely uniformity of work and the men are among the best mechanics to be found. You can see this by watching them work. What is true of the shop is true of the other departments. On the showroom floor you are met the instant you come in by someone, so that whether you want to buy a car or tractor or talk politics somebody will give you attention. This is a feature too often overlooked in service stations. Nothing makes a customer so peeved as to find nobody home to him or too busy to take care of one who apparently is looked upon as an intruder.

Place Well Laid Out

Take the ground plans of this building and see how well the place has been laid out. The tractor department, you will notice, has been totally divorced from the car department and is in charge of men who as motor car salesmen make better tractor men. The main floor has besides a well appointed showroom the parts department, so customers do not have to ascend a stairway to a department so often buried from sight. You can see from the sidewalk the accessory department, and it is so well arranged that if you are a Ford owner you just can not help going in and seeing what you can buy to doll up the car. Here is a case where the dealer has made his accessory department so lively and attractive that it is a decided asset instead of liability, so often the case where a good line of accessories is buried in a dirty showcase somewhere in the rear or top floor of the place. To make purchases easy photographs of the parts are framed, and the customer easily can point out what he wants if he is not acquainted with the part. The glass frame also prevents the charts from getting soiled. The parts bins are painted white and offer a decided contrast to the unpainted variety smeared around with greasy finger prints.

In one corner of the main floor is the service department where cars are given first aid. Entrance is gained by a sliding

Exterior of O'Maley's service station, showing fleet of service cars

door in the alley or through the elevator. The elevator carries cars to the shop on the second floor, where are the engine overhauling and repair department, radiator department, paint room, tools department and transmission and axle departments.

One of the best features on the second floor is the overhead track on which run several chain hoists. Thus when a car comes up to the second floor it is parked as shown in the photographs, and if the engine is to be overhauled it is removed from the car by a hoist and sent to the engine department, where a progressive system of repair is installed. The engines are dropped on a bench for dissembling and the various units sent to men doing certain parts of the job. Finally the engine is put on the burning-in stand and lastly on the running-in stand. From this the hoist picks it up and sends it back to the car. The track is fitted with two switches so the engines can be sent into any direction.

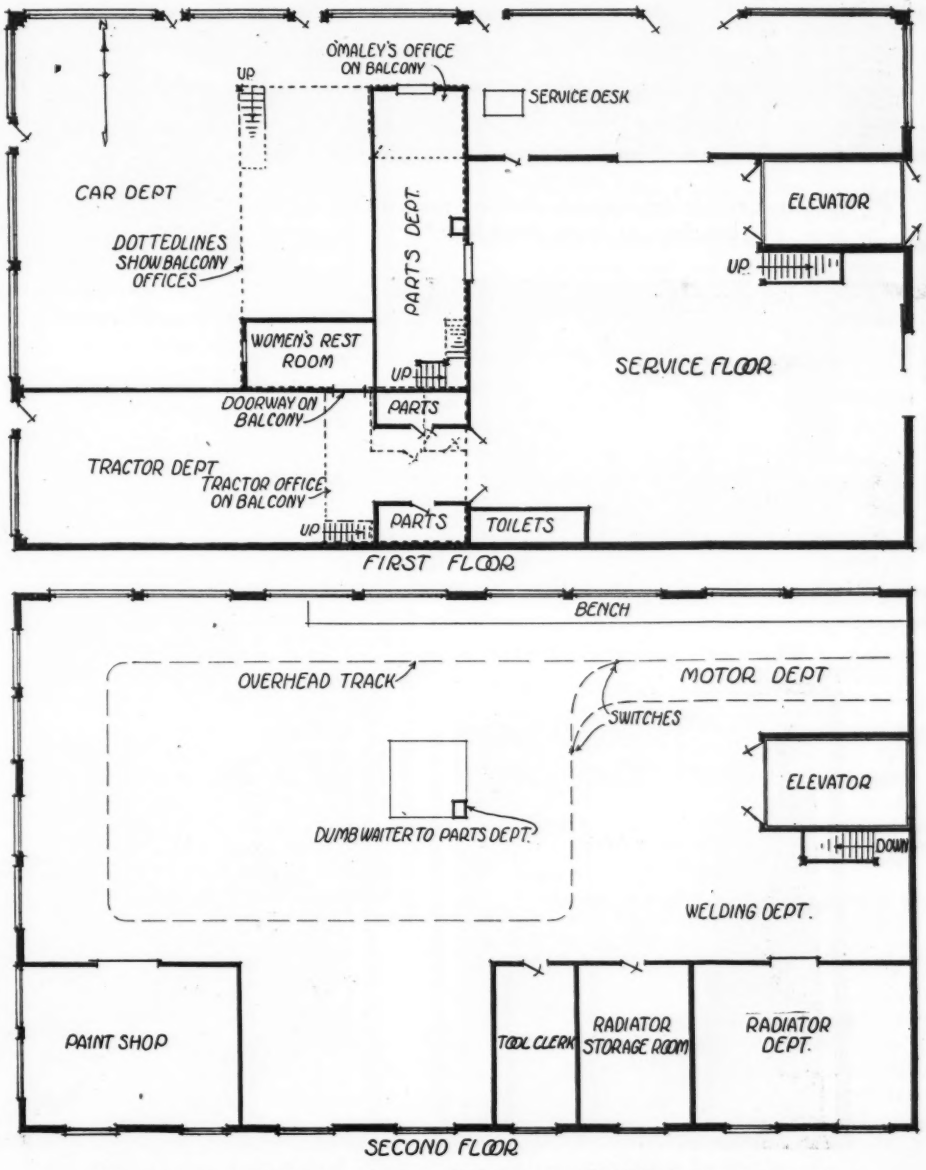
Good Light Provided

The light in the shop is excellent and the placement of the machinery has been done to take advantage of this. All benches are covered with galvanized sheet iron and periodically cleaned. The walls of the shop are painted white and once a week the posts are painted "just to keep the place looking neat" as a workman remarked. A red band is painted on the posts carrying fire extinguishers.

The shop has all sorts of labor-saving stunts, a good many of which have been installed by R. T. Carlson, the foreman. He has made a crankshaft holder which does away with the old method of clamping the flywheel flange in a vise. It is a rapid-acting outfit and incorporates also an attachment to reline Ford transmission bands. On several of the radiators in the shop you see tanks which contain water. In winter this comes very handy. There are shelves on the walls for the small horses to put under cars when not in use. This gets them off the floor. You see little lying on the floor in this place. There are stands for the axles and benches of a comfortable height for the workmen.

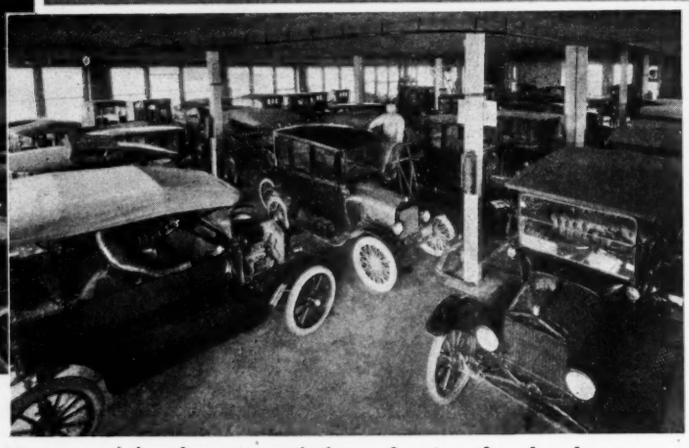
Here is a little wrinkle well worth following by other dealers. In the radiator department the stands that hold the radiators while they are being worked on rest in sheet-iron pans to catch the drippings after testing the job. This means a clean floor, and the workman does not have to stand in water.

O'Maley has half a dozen service cars that take care of all work, whether car or

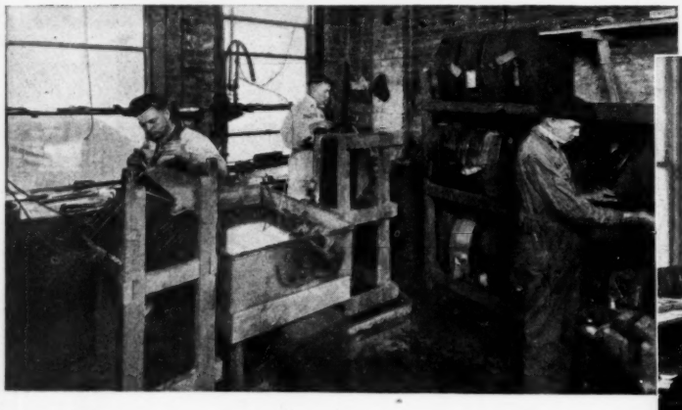


Arrangement of first and second floors in O'Maley's service station

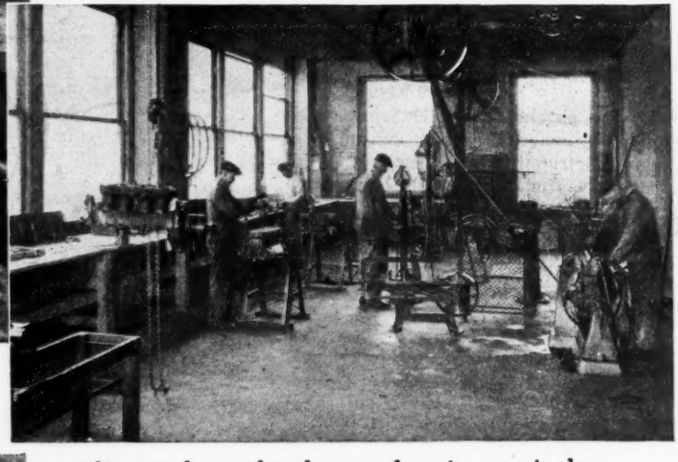
General view of shop, showing overhead track for hoists which carry engines to shop



Another view of shop, showing the abundance of light

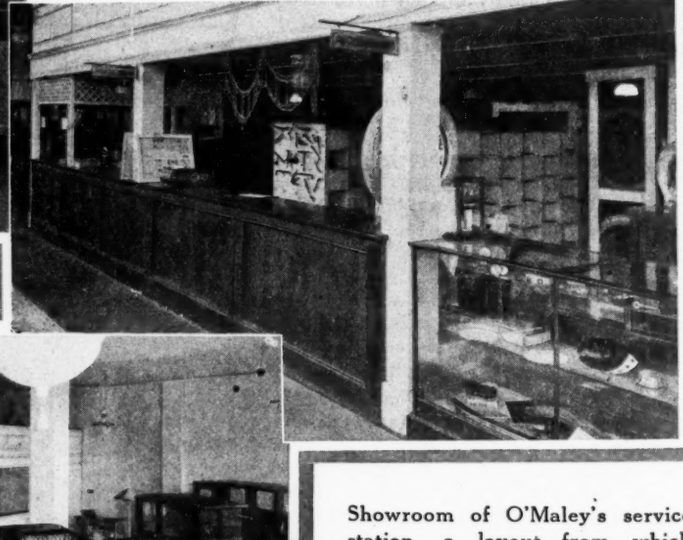


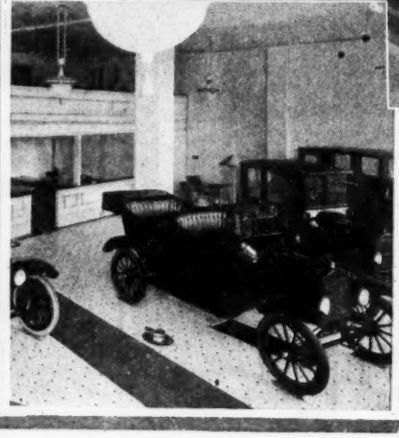
Radiator repair department, showing pans under benches to keep floor dry



Neat and complete layout of engine repair department. Below, orderly arrangement of the accessory and parts stock

Where axle and welding work is done



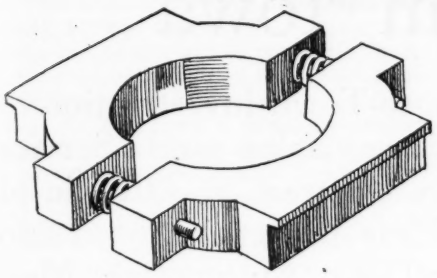


Showroom of O'Maley's service station, a layout from which many dealers can learn

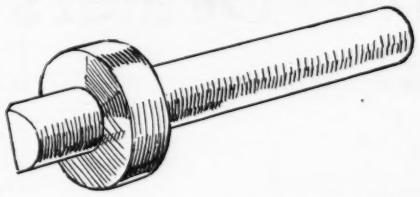
Many novel features are necessarily lost in these small views.

Close-ups of these will be shown in following issues

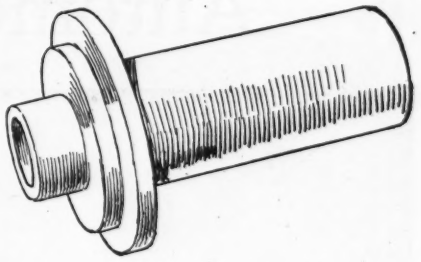
These O'Maley Shop Kinks Speed Up Service



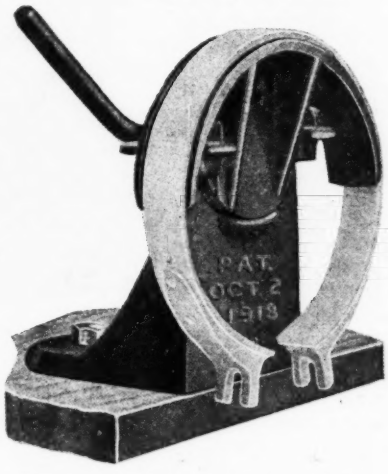
Piston clamp or vise intended to be inserted in the jaws of a regular bench or machinist's vise. Alignment of the two parts is secured by the steel dowel pins and the apparatus is adjustable for different sized pistons. The projecting edges are for resting on the jaws of the bench vise



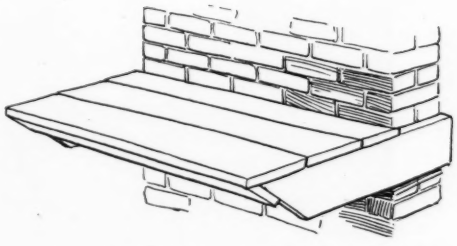
Piston pin and cotter pin tool. The Ford piston pin lockscrew is held in place by a cotter pin and can be easily gotten at with this tool, the sharp edge cutting off the prongs of the pin, after which the piston pin can be driven out by the collar pinned on near the the sharp end of the tool. The collar, of course, is made a trifle smaller in diameter than the diameter of the piston pin



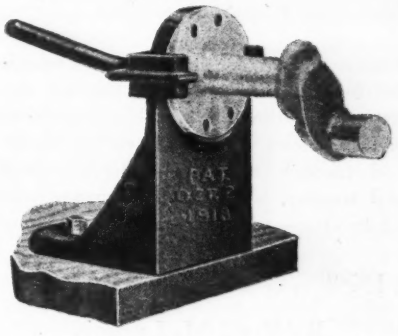
A transmission bushing removing tool made in O'Maley's shop. The working end of this tool is made with a stepped cone consisting of two steel collars of the right size to fit the low speed drum bushing, reverse drum bushing, and small end fits the driven gear sleeve bushing



The transmission band relining tool, used in conjunction with the crankshaft holder on the opposite side of the page. Riveting the lining into place on the Ford bands is a nuisance unless one has the right apparatus. An anvil horn has too small a diameter, but this tool is just right and rigid



At regular intervals along the wall in O'Maley's shop you find little wooden platforms like this. They are for keeping the small horses placed under cars off the floor when not in use. The edge is slanting to protect the workman from an accidental blow. Like other fitments of this kind in this shop, they are painted white



Rather than clamp a crankshaft in a bench vise where the jaws only hold a part of the flange, O'Maley's foreman has invented this apparatus, which holds the shaft so rigidly that a man can place his whole weight upon the protruding shaft. The lever at the back locks the shaft. This device is handy when fitting connecting rods

Apparatus for testing magneto, latter driven by electric motor

tractor. A tractor can be delivered by the truck and service rendered by any of the other outfits. During the summer months O'Maley's men go around the streets and look at Fords standing at the curb. They carry with them tags on which are printed several adjustments or repairs that in time must be made on cars. The service man hangs one of these tags on the steering wheel, calling attention to the fact that a new fan belt is needed, or whatever the case may be. The owner probably never dreamt of this, but you can rest assured he will drive to O'Maley's pretty soon for a new one. Much repair work has been received by this means.

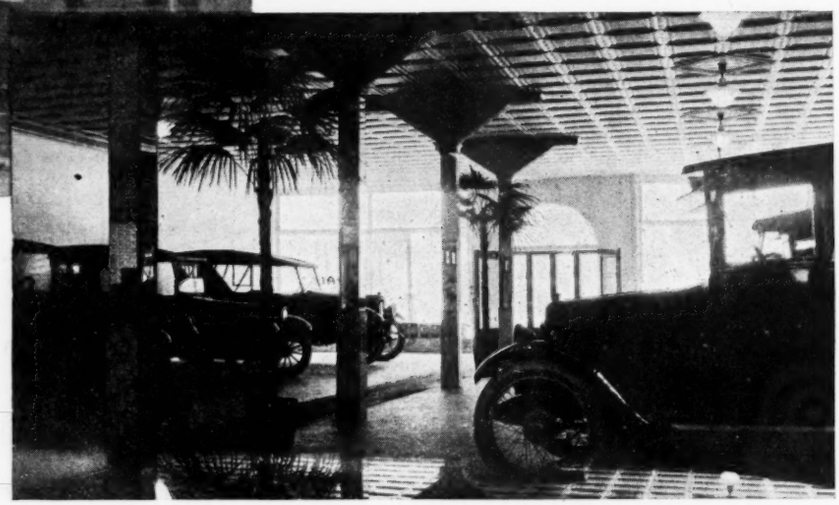
There is not a department in this whole establishment from which it is not possible by other dealers to profit. So far as we were able to see there is but one slight drawback in the layout admitted by the service manager, and that is the location of the tool room on the second floor away from the dumb waiter going to the parts department on the first floor. The result is that the person in charge of the dumb waiter and tool room must walk back and forth between them, whereas if they were incorporated into one, this would be obviated. However, did you ever see anyone put up a building with which he was entirely satisfied after it was rigged out? There are always one or two slight changes such an owner states he would make if he were to do the job over and in O'Maley's case we venture to say this change would probably be the relocation of the tool room and dumb waiter to centralize the work.

The paint shop has proved a profitable investment, but is too small to accommodate all the work, making it necessary to do much of the work, which should be done in a dust-tight room out in the general shop. But quick drying enamel skillfully applied reduces the danger of spoiling the finish to a minimum. The building has been designed so that another story can be added and it looks as if this must be done before long.

This concern also does considerable work along the lines of remodeling trucks. In some cases an owner wants a certain type of body or wants to install an inclosed cab, make new doors, re-upholster the seat cushions, have dents taken out, etc. All of this work is handled on the second floor and these men are equally skillful as carpenters, cabinet makers, blacksmiths, upholsterers, etc. O'Maley's, in fact, is an all around establishment where the car owner gets about everything he wants.

Automotive Dealers in Iowa

Town-to-Town Investigation of Tractor Sales and Service Shows Contrast in Attitude of Old-Time Implement Man and Up-to-Date Automotive Merchant and His Service Plant



Attractive environment from which the Cleveland tractor is sold at Carroll, Ia., contrasted with the decrepit blacksmith shop in the same town which houses the agent for a good tractor, with the outside storage accorded that tractor—two extremes of merchandising

IN TWO PARTS—PART I

By Fred M. Loomis
Motor Age Editorial Staff

"A FARMER is a blankety-blank fool to buy a tractor, and I tell him so. I think too much of my customers to unload onto them such piles of junk as most of the tractors are. Of course, if one of the blanked fools comes in here and insists on buying a tractor, why, I sell him one, any one he wants, but at the same time I tell him plainly just what an ass he is making of himself." These are the tractor sentiments, expressed to me, of George W. O'Brien, one of the two exclusive retail implement dealers at Ames, Iowa.

Two Points of View

The other exclusive dealer there, the Loughran Implement Co., says there is not very much interest in tractors yet among the farmers in that vicinity, and no very great effort is being made by the company to push sales. Two or three Waterloo Boy tractors have been sold by the concern but no further special effort will be made until such time as the farmers manifest more interest than they have hitherto.

Yet the Dunlap Motor Co., handling the Ford car and the Fordson tractor, with all the equipment which goes with the latter, put out some fifteen machines last year and expects to sell fifty or more this year. At a tractor school which Dunlap held for 2 days in March he had 150 interested farmers on the first day and 300 on the second. *He registered no less than* 800 *names of men who professed to be interested in automotive equipment of some kind, a majority of whom specified tractors,* while F. H. Lang, who has charge of tractor sales for Dunlap, tells me that after a house-to-house canvas of his territory, made during the last 3 months, he has over fifty live tractor prospects, most of whom he is sure to sell during 1919. Four complete tractor outfits were sold and delivered during the school.

That's the difference in the estimate of tractor interest made by the old-time retail implement man and the new-time automotive dealer. An extreme case? Perhaps. Nevertheless, in the light of all I saw and heard during a 2 weeks' trip recently concluded in Iowa, it is very typical of the tractor situation there as I found it.

Let me say at the outset that I did not expect to find any such thing, never having even dreamed that conditions are as they are. In fact, I was not looking for such things but went to Iowa for a very different purpose. After visiting two or three towns certain facts and tendencies forced themselves upon the attention so definitely that it was impossible to ignore them. So, while pursuing the original purpose of the investigation, I took notes of what was seen and the following story is, I believe, a fair, impartial and unbiased record of what the present status of the tractor business is in such portions of the state of Iowa as was visited personally. These facts give the right to draw certain inferences and conclusions as to what exists elsewhere in the same state. Also what was seen justified certain inferences as to the probable course the tractor trade will take in the future. If this is true it is vital.

Also allow me to say that I did not pick my towns. I took them as they came. I worked in one direction along one line of railroad, and returned over another road, stopping off at towns little and big. I shall tell the story in the same order and leave the reader to judge whether the conclusions I reach are or are not justified by the facts as I found them, for they are facts which anyone who doubts may easily verify.

Newton, Iowa

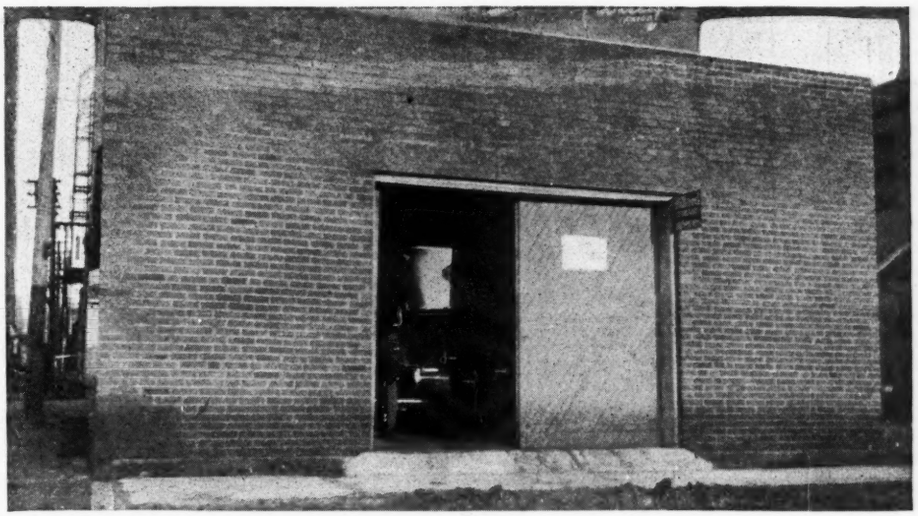
With the exception of the Newton Implement Co., handling the I. H. C. tractors, all other tractors represented at Newton are sold by automotive dealers. Charles R. Notestine sells Overland cars, Republic trucks, and Advance-Rumely, Emerson-Brantingham and Waterloo Boy tractors. E. J. Miles & Co. sell the Ford car and the Fordson tractor and Delco farm lighting plants. The Motor Sales Co. sells the Dodge Brothers, Hudson and Essex cars and the Moline-Universal tractor. *Everyone of these automotive dealers sells also the farm equipment which goes with the tractor.*

THE NEWTON IMPLEMENT CO. OCCUPIES AN OLD BARN-LIKE STRUCTURE WHICH HAS NO MODERN BUSINESS CONVENIENCES AT ALL. THE COMPANY HAS NO SERVICE EQUIPMENT AND KEEPS NO SPECIAL TRACTOR SALESMAN. WHEN ASSISTANCE IS NEEDED FOR TRACTOR SERVICE AN I. H. C. MAN IS CALLD FROM DES MOINES BY TELEPHONE. THIS IS TYPICALLY AN IMPLEMENT CONCERN AND THE BUSINESS IS HANDLED IN THE OLD-STYLE IMPLEMENT MANNER.

Charles R. Notestine is a new man at Newton, although he has had a number of years of experience as an implement dealer elsewhere. He has for the present a

wretched place in which to try to do business, but hopes to be more advantageously located a little latter. He realizes that service is all-important in the tractor business and while he will not have much service equipment until he secures a better location, he has hired a first-class tractor mechanic and put him in charge of the service department. He intends to give one-day service on all tractors put out by him. Notestine is trying to sell too many lines. He also is leaning on a weak reed as regards financing. He has been looking to a guarantee mortgage company in Des Moines to help out in this respect, but the company manager tells me that it has been found impracticable to finance tractors on the monthly installment plan and the mortgage company will retire from the tractor field. For service on equipment Notestine will rely upon his own knowledge of farm implements.

E. J. Miles & Co., the Miles Mfg. Co., and the Motor Sales Co. are interrelated and occupy the most substantial and best equipped motor car establishment in the town. The Miles Mfg. Co. manufactures garage equipment and its well appointed factory and force of skilled mechanics are at the command of the selling organizations for service. The company maintains two service trucks, a 1-ton fast truck and a larger one for heavier work. Prompt service is guaranteed and given on motor cars, motor trucks, tractors, farm lighting plants and farm implements.



A so-called service station at Perry. It will hold about two cars or tractors

The sales end of the business is well manned. The younger Miles looks after the Ford and Fordson interests of E. J. Miles & Co., while M. S. Brunner, with 14 years' experience as an implement man behind him, manages the business of the Motor Sales Co., with its growing business on the Moline-Universal tractor.

One does not require much power of perception to see that the automotive interests dominate the tractor business of Newton at the present time, nor does one need to be a prophet to discern that they are likely to continue to do so.

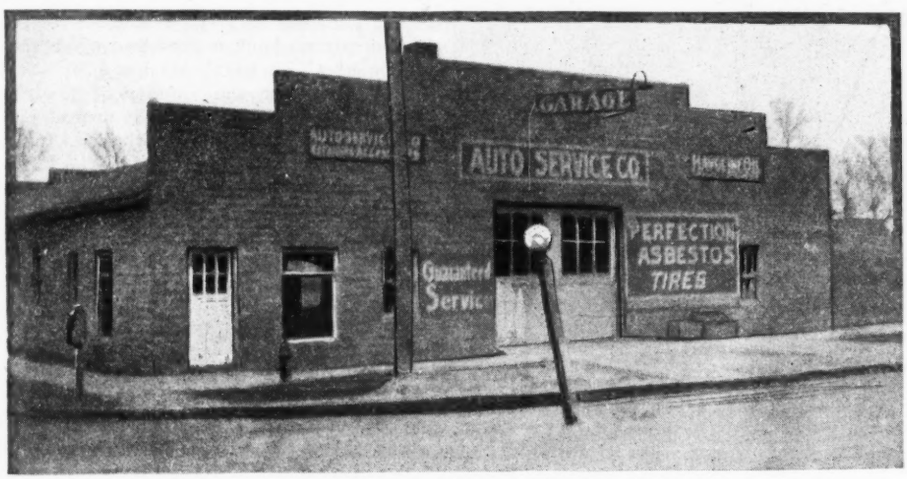
AT PELLA, THE IMPLEMENT INTERESTS ARE OUT OF THE RUNNING ENTIRELY WHEN IT COMES TO THE TRACTOR. THERE ARE RUMORS THAT ONCE UPON A TIME THEY TRIED IT, BUT EITHER THEY WERE DRIVEN OUT OR RETIRED FROM THE BUSINESS VOLUNTARILY, FOR AT THE PRESENT TIME THEY DO NOT HANDLE TRACTORS AT ALL.

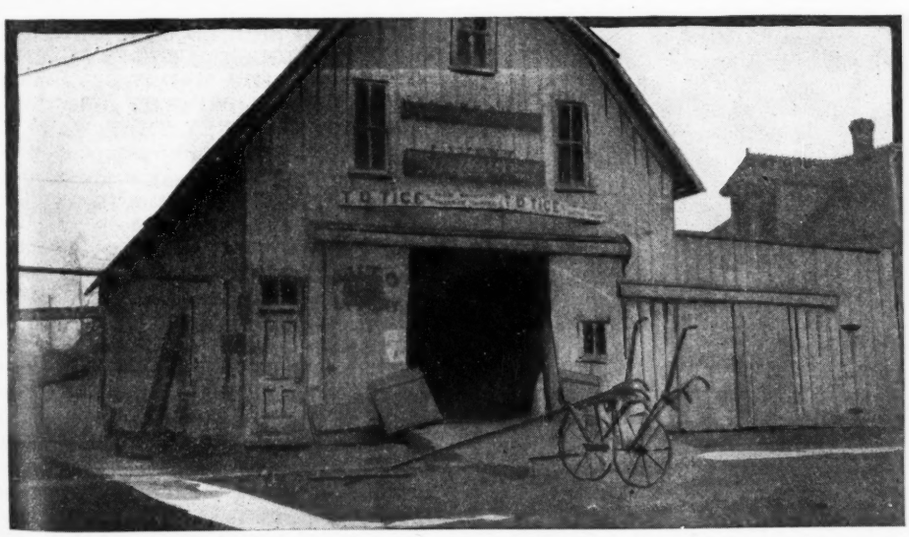
The tractor trade here is controlled by the Pella Motor Co., with the Moline-Universal, and by F. Le Cocq, with the Fordson. Both have solid, substantial brick buildings and both have well equipped repair shops, the shop of the Pella Motor Co. being well equipped and efficient.

A Complete Automotive Business

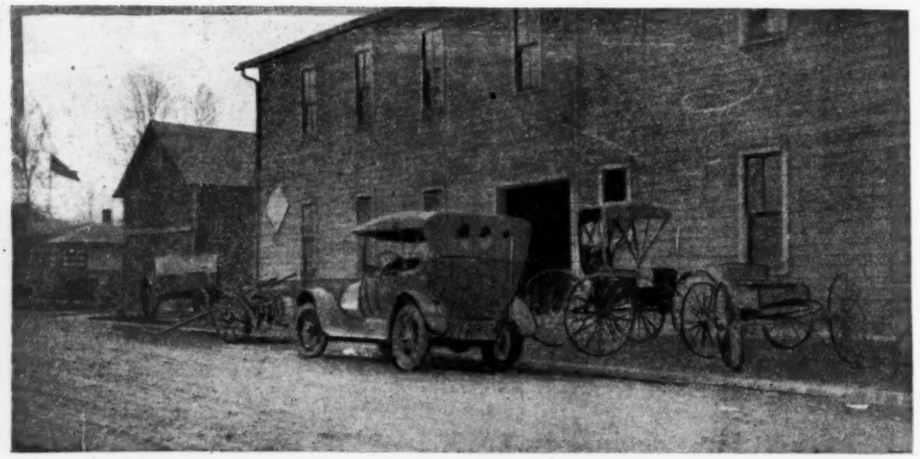
The Pella Motor Co. has been in the automotive business for about 12 years. It was started originally by Ed. Van Gorp. Associated with him now are Fred Lankeman and Earle Black, the latter paying particular attention to the tractor and equipment end of the business. The company sells the Overland, Hudson and Cadillac cars, the Republic truck and the Moline-Universal tractor and equipment. The company prides itself upon the fact that in all matters of service it is entirely sufficient unto itself, never having been compelled to call on the factory for assistance on tractors but once, and then it was the fault of the factory. Motor trucks are used for the delivery of tractors to the farm and for answering service calls. The policy of the company is never to allow a tractor to stand idle in the field a minute longer than it takes to get to it. An unusually large stock of tractor spares is maintained so that the company may be ready for any emergency. The selling plans are aggressive and well conceived.

The Ford and Fordson dealer, F. Le Cocq, traces his pedigree back through all stages of the implement business. He started originally as a harness maker, added buggies in time, and finally became an





Below is the emporium of an implement man at Pella, Ia., who "found tractors didn't pay." Above is an example of a business that will become more common—an exclusive automotive equipment repairshop at Pella, Ia.



Tractor representation in Newton, Ia., presents a characteristic contrast. Above, is the establishment of the Newton Implement Co., agent for a well-known tractor. Below, the salesrooms and service station of the Motor Sales Co. and E. J. Miles & Co., where Fordsons and Moline Universals are sold

exclusive implement and vehicle dealer. After many years he read aright the handwriting on the wall, closed out his implement, vehicle and harness business and now devotes himself exclusively to the Ford products, including the farm equipment which is being sold with the Fordson tractor. His experience as an implement man gives him confidence in his ability to do anything along the service line his customers may ask for on tractors or on the equipment which goes with them. His service is one-day, efficient and satisfactory.

The White Way Motor Co. also handles tractors but has not got very far yet.

Pella also has an exclusive automotive repair shop, the Auto Service Co., heretofore confined to motor cars and motor trucks; the equipment and activities of the company now will be extended to tractors.

IN THIS TOWN THE AUTOMOTIVE INTERESTS ABSOLUTELY CONTROL THE TRACTOR SITUATION.

Perry, Iowa

Perry is quite a tractor town. The Rude Auto Co. sells the Fordson; E. A. Lester & Co., the Moline-Universal; The McCarthy Auto Co., the Samson; C. E. Seneff, hardware and implement dealer, the I. H. C.; a blacksmith, the Wallis Club and a housemover, the Huber.

The loud noise here in the tractor trade is the Rude Auto Co. with something like twenty-five Fordsons already in the tributary territory and a stock of thirty-one in the company's warehouse awaiting delivery. Four complete outfits were delivered in February. Complete outfits is said advisedly, for Manager E. J. Haupert has such a persuasive way with him that when he sells a Fordson tractor he usually induces the customer to take also the plow, the disk harrow, the culti-packer, the pulley, the fenders and, in a number of instances, the disk grain drill as well. Each of these sales aggregates over $1,500.

THE RUDE BUSINESS IS AN INSTANCE OF SUCCESSFUL DEPARTMENTIZATION AND WHAT HAS BEEN DONE ALONG THIS LINE IS A SPECIAL STORY BY ITSELF. SUFFICE IT TO SAY HERE THAT A PRACTICAL FARMER HAS BEEN TRAINED IN SALESMANSHIP AND HAS BEEN PUT AT THE HEAD OF THE TRACTOR DEPARTMENT WITH MOST EXCELLENT RESULTS.

The company has a superbly equipped repair shop which employs a foreman and nine mechanics and the outside equipment includes service trucks and service cars. The company service is designed to be and is practically instantaneous. The tractor, too, is followed onto the farm through a series of follow-up visits from shop foreman, service man and salesman so that satisfaction on the part of the farmer is assured.

E. A. Lester & Co., handling the Hupmobile and Lexington cars and the Moline-Universal tractor, got fifteen tractors out last year and expects to do as well or better this year. He renders good and prompt service and has up-to-date selling methods.

The McCarthy Auto Co.'s tractor experience is more hope than realization at the present time. The company sold a Samson Sieve-Grip, and, inasmuch as it handles the Janesville line of farm implements, it hopes to secure control of the new Samson tractor lines, but do sn't know.

C. E. Seneff, the implement representative in the tractor contingent at Perry, is also a hardware dealer and likewise sells the Overland car, so he may be called legitimately an automotive dealer too. He has made concession to modern methods of merchandising tractors by employing a special tractor salesman but he has no service equipment whatsoever.

What the blacksmith and the housemover are doing I don't know.

The question as to who controls the tractor trade at Perry admits of no doubtful answer.

Manning, Iowa

As far back as I can remember, and my memory runs back a good many years, the name of C. H. Reinholdt has been one to conjure with in the vicinity of Manning. The hardware and implement firm of C. H. Reinholdt & Co. is one of the best known and most substantial in that part of Iowa. The concern occupies one of the best built structures in the town, carries a large and varied stock and keeps it up in good shape. Among other things the firm sells is the Avery tractor, a dozen or so of which have been put out.

NOW I AM PERSONALLY ACQUAINTED WITH REINHOLDT AND I ASKED HIM WHAT HE WAS DOING IN THE WAY OF SERVICE ON TRACTORS AND WHETHER HE KEPT A SERVICE MAN OR ANY SERVICE EQUIPMENT. "NEITHER ONE NOR THE OTHER," HE REPLIED, "WHY SHOULD I? IF ANYTHING SHOULD GO WRONG THE BRANCH HOUSE AT DES MOINES WILL SEND ME A MAN FREE, GRATIS, FOR NOTHING, SO WHY SHOULD I SPEND ANY MONEY THAT WAY?"

A. E. Brockmann, who sells the Studebaker car here and who just recently has taken on the I. H. C. tractors, thinks differently. At the present time he is equipping a service station from which he expects to give prompt and efficient service on all kinds of automotive equipment. *Before he took on a tractor, too, he went into the country and investigated farming conditions and the troubles which farmers had experienced with the tractors they had bought. Then he selected that machine which in his judgment promised most nearly to satisfy local needs.* This is the sort of discriminatory selection automotive dealers are bringing into the tractor business here and there. Brockmann, too, is a real tractor expert, for he worked for 3 years in the Heider factory.

F. D. Ross sells the Ford car and the Fordson tractor at Manning but it must

be confessed he has made rather difficult weather of it thus far.

The remaining automotive dealer here, T. D. Parkhouse, sells the Auburn and Maxwell cars and the Heider and Appleton tractors. He, too, has made slow progress up to date. Parkhouse devotes a considerable portion of his time and energy to pushing small power equipment, such as washing machines, feed grinders and the like, and has made something of a success along these lines.

Inefficient as the service may be which Reinholdt has been giving he still has the call on the tractor business here. Brockmann, however, looks like a comer and there may be a different story to tell at the end of this season.

Carroll, Ia.

At Carroll, Ia., the Swaney Automobile Co. sell the Fordson; H. J. Olberding, the Advance-Rumely; Albert McNabb, the Cleveland; Arment & Franzwa, the Dart, and Emerson-Brantingham; Healey & Cahill, the I.H.C., and some blacksmith the Waterloo Boy. These all are motor car dealers but the last two.

Healey & Cahill succeed a concern which for years was noted as keeping one of the most orderly and well selected stocks of implements in central Iowa. The present concern may not be quite so orderly, yet it has the best implement business in the town. Mr. Cahill tells me, however, that had it not been for the trade on tractors and tractor implements which the company secured during 1918, the concern might just as well have been out of business since the trade on horse-drawn implements alone never would have supported it. This is a very significant statement in view of the fact that the automotive interests are securing so nearly a control of the tractor and tractor equipment business.

The Swaney Automobile Co. is one of the strongest of the retail concerns in the Ford organization in Iowa. Swaney himself, in point of years of service, is the oldest Ford dealer in the state. He has built up a great organization. In addition to the main store at Carroll he maintains branches at Fort Dodge, Gowrie, Rockwell City, Boone and Jefferson. At nearly all of these places he ranks as the leading automotive dealer in the community.

SWANEY HAS AN UNUSUALLY GOOD REPAIRSHOP AT CARROLL AND HE IS BRINGING THE SHOPS AT ALL HIS BRANCHES UP TO THE SAME STANDARD. HE GIVES PROMPT, ONE-DAY SERVICE AND IS PUTTING IN SERVICE TRUCKS AND IS TRAINING SPECIAL TRACTOR SALESMEN OUT OF MEN WHO KNOW THE FARMING BUSINESS. HE IS ENTHUSIASTIC OVER THE POSSIBILITIES OF THE TRACTOR TRADE AND IS PREPARING TO GO AFTER IT VIGOROUSLY WITH UP-TO-DATE AND AGGRESSIVE SALES METHODS AND IRREPROACHABLE SERVICE. HE ADMITS HIS TRACTOR PLANS ARE NOT MATURE YET BUT HE EXPECTS TO HAVE THEM UP TO THE SCRATCH WITHIN A SHORT TIME.

H. J. Olberding, selling Chalmers cars and the Advance-Rumely tractor, cannot see the small tractor at all and appears to be sincere and conscientious in this belief. He consistently advises against the small machine, contending that the farmer needs a larger tractor for its capacity on the belt. He has very little in the way of service equipment.

Albert McNabb sells the Paige, Maxwell and Saxon cars and the Cleveland tractor. He has what is by all means the finest and prettiest show room I saw in Iowa outside of Des Moines. It would be a credit to Michigan boulevard in Chicago.

McNABB, HOWEVER, IS ONE OF THE TWO MOTOR CAR-TRACTOR DEALERS WHO APPEARS TO HAVE COLD FEET ON THE TRACTOR PROPOSITION. BUT THE TROUBLE APPEARS TO BE THAT HE IS TRYING TO RUN HIS BUSINESS ON THE ONE-MAN PLAN, WITH SEVERAL OUTSIDE INTERESTS TO LOOK AFTER ALSO, WITH THE RESULT THAT HE IS TRYING TO DO TOO MUCH AND NEVER CAN SUCCEED UNLESS HE CHANGES HIS POLICY IN THIS RESPECT.

Arment & Franzwa, with the Oldsmobile and the Dart and Emerson-Brantingham tractors, are just getting into motion and it is not even fair to speculate at this time when and how they will arrive.

Shipped on Advance Dating

At Carroll I met a traveling representative of the J. I. Case T. M. Co., who said he had been making the rounds of the implement trade in Iowa trying to get the dealers to stock tractors, but with very small success. He claims that most of them are afraid of the tractor proposition, and, while they are willing to make a contract, they object to putting a tractor in stock. To meet the situation he says his firm, having a lot of tractors on hand at the factory, shipped machines to dealers during the winter, making a May 1, 1919, dating on them. I have been reliably informed that the International Harvester Co. has been doing practically the same thing.

As far as Carroll is concerned, the tractor business is as yet undeveloped, with the chances in favor of the automotive dealer.

At Jefferson, Ia., there are two implement concerns handling tractors: E. B. Culter with the Moline-Universal, of which he has sold seven, and M. D. Brian, with the Avery, with an unknown number out. Among the automotive dealers are F. H. Martin & Co., with the Davis car and the Emerson-Brantingham tractor; F. M. Montgomery, with Dodge Brothers, Cadillac and Reo cars and the Happy Farmer tractor; Smith & McCuen, with Paige and Chevrolet cars, Commerce and Paige trucks and the Cleveland tractor, and the Jefferson Auto Co., a Swaney branch, with the Ford and Fordson.

As usual, the implement men have nothing but the most rudimentary of service equipment. In this particular, the Jefferson Auto Co., with sixteen Fordsons out, has by far the best there is in the town, and, being one of the Swaney branches, it is getting better constantly. Martin just has gone into the tractor business and Montgomery has sold three Happy Farmers. Smith & McCuen have an aggravated case of cold feet on the tractor proposition, the second of the two motor car dealers I saw who are likely to quit.

Generally speaking, the tractor situation here is much the same as it is at Carroll, with the possibilities waiting for future development.

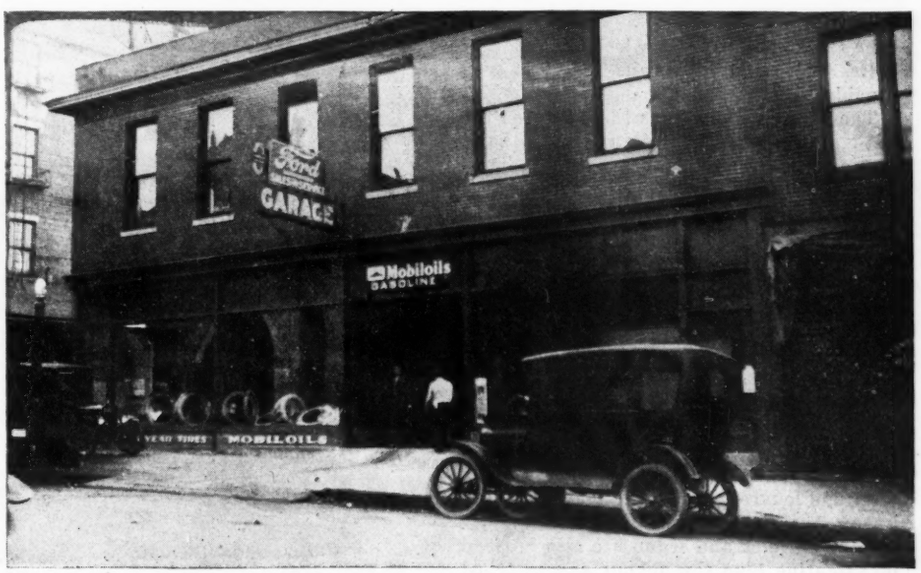
(Concluded next week)

TO MARKET FARM LIGHTS

Des Moines, Ia., May 13—Another of the pioneer Des Moines motor companies has gone into the farm lighting field. George Means, who has been in the motor car field here for many years, has organized the Means Electric Farm Lighting Co. and opened sales offices and service rooms. The concern will handle the Universal plant. Mr. Means is optimistic over the outlook for farm lighting systems, and thinks that if the same efficient methods which the motor car sales organizations have used are put to the farm lighting business, Iowa will be a fruitful field. The new company will control the entire state of Iowa from the Des Moines office.

U. S. LIGHT & HEAT BUILDING

Niagara Falls, N. Y., May 9—The U. S. Light & Heat Corp. is adding several new brick and concrete buildings to its present plant, which consists of twenty-two units, to give the company increased manufacturing facilities.



Rude Auto Co., Ford and Fordson dealers, plant at Marshalltown, Ia.

Body Refinements Mark New Hudson

Riding Comfort Increased with Addition of Longer Springs and Lower Seats

THE new Hudson car is represented in two principal types, the touring car and the four-passenger phaeton, each mounted on the same chassis, which has undergone such detailed changes as have been made necessary for increased riding comfort, and for greater strength. Among the strengthened portions are the frame, increased to 7 in. in depth; the ring gear and pinion, and the spring shackles.

The springs are slightly flatter, giving greater riding comfort. The changes in the body are the noticeable items in the new car. The seats are lower, being raised above the floor by the thickness of a real heavy double spring cushion, as the illustration shows.

In the seven-passenger phaeton, the backs of these seats have been leather in long grain leather pleated over Marshall springs. The steel braces supporting the touring limousine are finished in light Brewster green, deep maroon and valentine blue, and are upholstered in harmonizing fabrics. Following are the new and old prices:

	New Price	Old Price
Seven-passenger phaeton	$1,975	$2,200
Four-passenger phaeton	2,075	2,300
Cabriolet	2,450	2,750
Sedan	2,775	3,000
Coupe	2,950	3,100
Touring limousine	3,300	3,400
Limousine	3,650	3,650

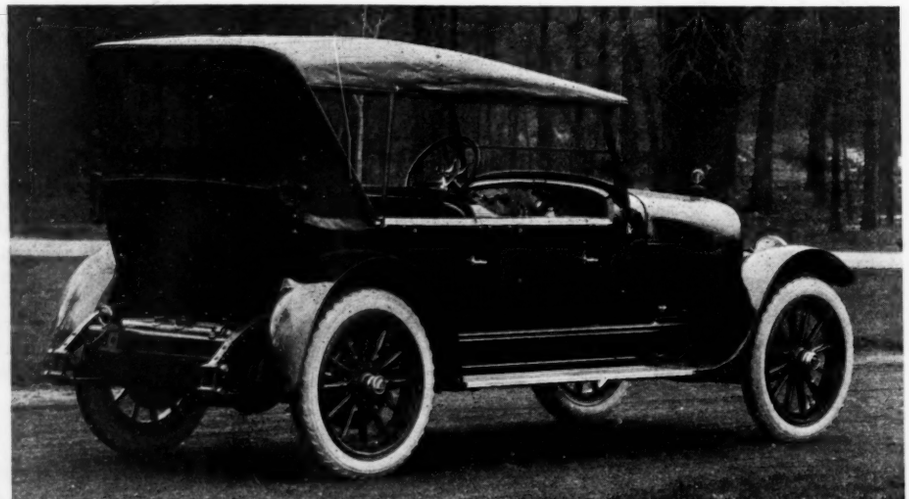
TANK CLIMBS PIKE'S PEAK

Denver, Col., May 3—Denver's intensive drive for the Victory Loan last week was ushered in by a spectacular battletank climb up the corkscrew road to the top of Lookout Mountain, in the city's system of mountain parks. The war-scarred tank—christened "Little Zeb," in honor of Lieut. Zebulon Pike, at the start of its recent climb up Pike's Peak—covered the six miles from Golden to the top of Lookout in less than two hours, in spite of steep grades and a road made slippery by an all-day rain.

At the finish of the climb the tank left the road and climbed a rough slope of forty-five degrees to the grade of Col. William F. Cody ("Buffalo Bill").

SQUIRES DESIGNS STEAMER

Detroit, May 9—John Squires, formerly chief engineer of the Signal Motor Truck Co., has organized the Squires Engineering Co. and has opened a laboratory here. Squires is working on a new motor, a steam-power plant, which will get its heat from a distillate fuel. The engine is nearly complete and is covered with many patents. He hopes to have it in operation in an experimental car by early fall.



The noticeable changes in the new Hudson are seen in the low body and flat springs

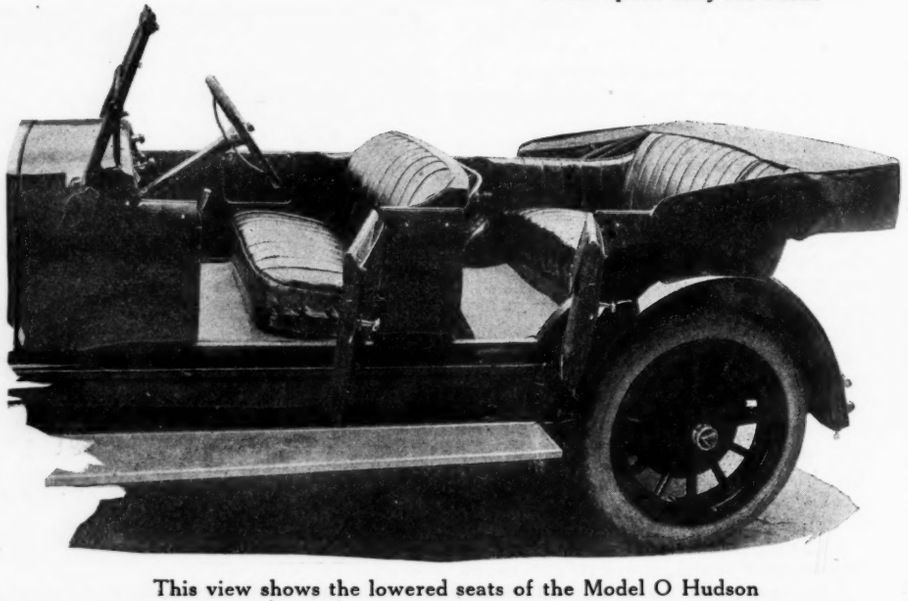
covered. Scuff plates now cover the entire door opening and the door locks have larger bolts. Solid brass robe rails have also been provided.

The robe rail now runs the width of the back of the front seat to provide a hand rest for passengers entering the tonneau and all of the fixtures are nickel plated.

New painting styles are also used on the Model O Super-Six. The body and wheels of the seven-passenger phaeton are finished in Valentine blue with black fenders. The body is striped in white and the hood louvres and wheels are also painted in the same manner to bring out the lines of the car.

The body of the four-passenger phaeton is finished in the same shade of blue as the seven-passenger, but the wheels are vermilion and the striping on the body level and louvres sets off the four-passenger lines.

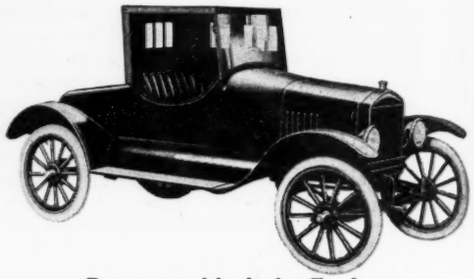
The cabriolet and sedan are also finished in valentine blue throughout and matched with the cloth upholstery. Upholstering is



This view shows the lowered seats of the Model O Hudson

Remo Speed Bodies

ANOTHER method of "raceabouting" a Ford is seen in the Remo body, that is made by the Auto Remodeling Co., 1501 Michigan Ave., Chicago. There are no changes to make when this body is applied to the Ford chassis. The steering post retains its original position, the running boards and fenders are left intact, as is the bonnet up to the dash. The body is made of heavy sheet steel with hardwood supports used for the pillars. All wood construction is rigidly held together, eliminating the usual squeaks from metal bodys.



Remo speed body for Fords

The seat is upholstered with composition material, having a double box spring cushion, the back cushion being fitted with springs also. The windshield is of one-piece ventilating construction, and is adjustable to any position. The top is of mohair, semi-permanent. That is, to take it down, it must be removed, and is then folded and placed in the rear compartment. Side curtains can be fitted to the top in inclement weather.

A C SPEEDOMETERS IN PRODUCTION

Flint, Mich., May 10—Manufacture of A C speedometers has been started by the Champion Ignition Co., maker of A C spark plugs. At the time of the armistice 40,000 A C aviation spark plugs were turned out daily for the Government. The plant built for Government work will be used for the production of spark plugs and speedometers. Jo. Berge will be in charge of the speedometer development and manufacturing departments.

New Light Car Lists at $295

Spacke Machine Has Two-Cylinder Engine—To Be Made Roadster Model Only

INDIANAPOLIS, Ind., May 13—A motor car that will run from 3 to 35 m.p.h., and will travel 40 to 50 miles on a gallon of gasoline, will be soon placed on the market to sell at $295. The car will be known as the Spacke, and will be manufactured by the Spacke Machine & Tool Co., Indianapolis. The first regular production of the new concern will begin within the next four weeks, and the Spacke company expects to turn them out at the rate of thirty a day. If present plans are carried out, over 10,000 of this type car will be made during the coming year.

The car is a racing type roadster, seating two persons, and is equipped with the Spacke 9-13 DeLuxe motor, a twin-cylinder air-cooled engine delivering from 9 to 13 hp. The car fully equipped weighs about 700 lb., and has a wheelbase of 90 in. Present specifications include, demountable wire wheels, 28 by 3-in. tires, Atwater-Kent ignition, gravity gasoline feed, and eccentric pump and splash type lubrication.

PERSHING WAY UNDER WAY

Cedar Falls, Iowa, May 13—The permanance of the Pershing Way has been insured by the incorporation of the organization in Cedar Falls under the title of the Pershing Way Association. Enthusiastic road meetings are being held by the boosters for the project and a weekly paper is being published. This highway is not to be confused with the Pershing highway which is the new name of the Pike's Peak Ocean-to-Ocean highway.

FEDERAL ROAD LAW PROBABLE

Washington, D. C., May 10—Adoption of a national highways policy by the United States Chamber of Commerce at its annual convention, coupled with recent announcements by Senator Penrose, the next chairman of the senate finance committee and Senator Bankhead, retiring chairman of the senate committee on post offices and post roads, that they stand for national highways tremendously strengthen the probability of passage of the Townsend bill at the extra session of Congress.

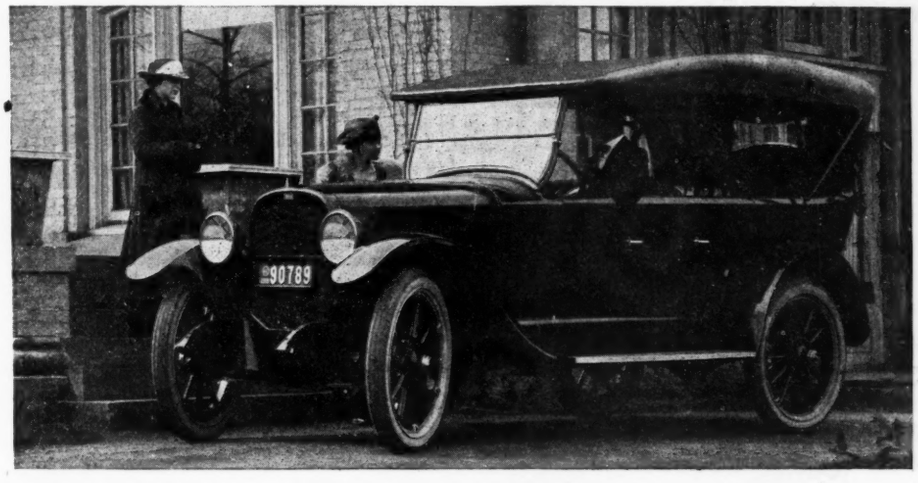
"A National Highway System can be kept within 3 per cent of the total mileage of highways in the United States and still serve our fundamental needs," according to David Jameson, president of the American Automobile Association, "has been definitely established by careful research. A zone 10 miles in width and 75 000 miles in length will reach more than 85 per cent of the population of the United States, more than 85 per cent of the taxable real estate and more than 55 per cent of the tonnage of farm products."

Chandler New Model Announced

Straight Lines Mark Body—Same Chassis Continued

THE new Chandler is offered in two new body designs, a fourster and a seven-passenger, each fitted to the same Chandler chassis, which for years has remained unchanged. The fourster model has a higher hood, a straighter line between the bonnet's junction and the body, larger doors and seated slightly lower than its predecessor, while the seven passenger model has the new angular appearing body with the beveled edge running in a straight line from the radiator, at the height of the hood hinge, to the rear of the car. This new body shape with the many vaned hood, the square doors, the outside door handles, the close fitting windshield and the beveled plate glass in the rear of the top, marks the touring car.

The Chandler chassis is offered again without changes. It has its six cylinders cast in two sets and these are bolted to the aluminum crankcase which is so cast that it forms the pan and base for the support of the auxiliary units. This construction has the crankcase bolted to frame at the four corners. Ignition is by means of a Bosch magneto, driven by a silent chain.



The seven-passenger Chandler is the main offering of the company's new models

The Chandler fourster body is mounted on the same chassis as the other models

Uniform Markers for Our Highways

Road Signs Recommended for Standardization

By Roy E. Berg

Motor Age Editorial Staff

HIGHWAYS soon will wind themselves over the entire surface of the United States, and under the present conditions no system is available to mark these highways or furnish a means for guidance. Every village in the country has a few signs nailed up to some trees at the immediate approach to the township, and sometimes beyond the limits of the villages one finds a few futile attempts toward the establishment of road markings. But there is no attempt to make these signs uniform. Signs of the most diversified nature are in existence. Some try to convey to the mind the presence of danger by crude and grotesque symbols. Some try to impress upon the mind of the motorist, various rules of the road by the immensity of the size, which is a means of making hideous the landscape.

France has established a system that is universal and that is self-explanatory. The condition of the road can be gleaned by merely glancing at the marker. Four of these are illustrated here and were advocated by a reader of MOTOR AGE recently. The psychology of remembrance by association need not be dwelt upon here. This is the principle, though, that makes the system of road markers used in France of great value. Iowa is making some progress in such a system.

It has been said by motorists in passing from one section of the country to another that as far as road signs are concerned it is like passing from one country to another. There is as much variation in the signs of New York and California, as there is in the performance of a three-legged horse and a twelve-cylinder car.

In laying down the requirements for a system of road signs, three things are essential, and when these three conditions are met nothing is left to be desired.

1—Legibility
2—Durability
3—Uniformity

Taking the signs of California and seeing how they meet these requirements, we see that legibility is one of the features of the signs. The size is 30 by 40 in., of baked enamel, with blue letters and a yellow background. This contrast in colors is so decided that the sign can be read by night almost as well as by day. The destructive nature of the small boy with a new gun also is provided for in this sign. Establishing a rule for the durability of a sign is difficult. It is not necessary to build signs similar to the ones used in Delaware County, Pennsylvania, which were made to last from forty years to forever. Construction such as that runs into money and is not necesssary, because in forty years a new and probably better route will have been laid out and then the markers remain as monuments only. Five years seems to be as much time as road signs ought to last.

The biggest factor that the road sign has against its lasting qualities is the man with the gun. If a target were placed next to every sign in the country, the desire to "see if you can hit the o in Road" would still remain. There is hardly a sign in the country but what it bears the obliterating marks of the shotgun, and the pity of it is that there is no method by which the sign can be protected from the gun.

Road markers now are erected by motor clubs and commerce associations generally, and it seems no more than fair to allow these organizations to have their names on the signs which they erect. But let there be a more uniform appearance to the signs. A good method would be to have the organization that erects the marker place its name or its symbol of recognition above the standardized sign similar to the method of the Chicago Motor Club.

Among the signs that need standardizing are the railroad crossing signs, signs that foretell of a sharp turn, those on the approach to a steep hill and those telling of impending danger.

Those telling of immediate danger should be illuminated so they will be just as easily distinguished by night as by day. A very good example of a sign of this type is the one erected by the Chicago Motor Club. Of course provision must be made to insure against malicious intent.

Uniformity Is Lacking

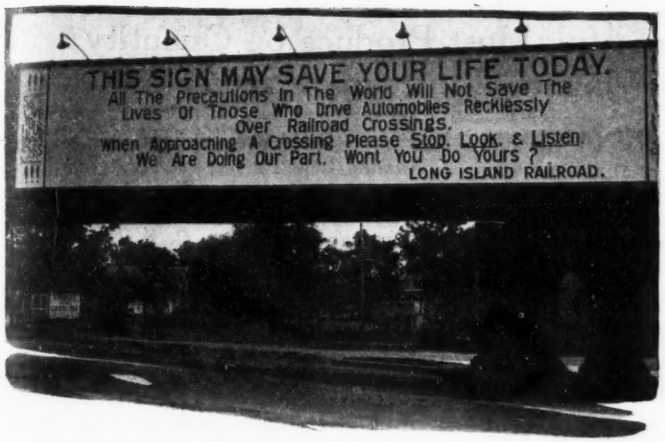
It is very easy to see from the illustrations that there is lacking a uniformity in the present day road markers. Everyone is aware of the conditions, but still no one seems to have the courage to offer a remedy.

First, it is necessary to enact legislation which will make it impossible to erect eyesore signs without violating the law. Then it is necessary for the state to adopt some uniform system and co-operate with the other states so that all will adopt the same system. Or a method which entails less work is to have national legislation enacted which will establish a system and destroy the old system, which is not a system but a collection of billboards.

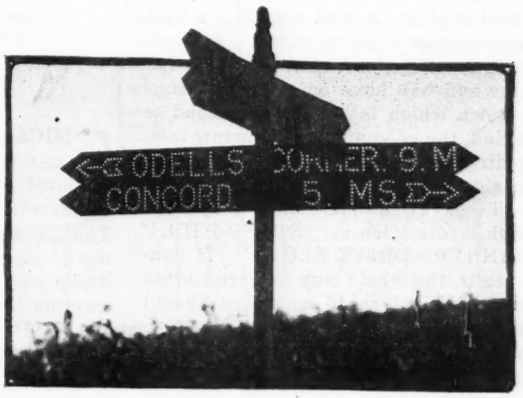
The markers that MOTOR AGE recommends are highly standardized, as can be seen from the following: All signs are placed on a metal post or pipe, which is sunk into the ground a sufficient distance to securely hold it, and means provided that will prevent the sign from being turned upon its axis and in that way give misleading information. Then the sign proper is to be made of sheet steel, enameled, with a white background and dark blue letters.

The sign will be made up of several standardized pieces and can be put together to meet the conditions of the locality. For example, there will be three, or

Road Signs Which Show Lack of Uniformity


THIS SIGN MAY SAVE YOUR LIFE TODAY.
All The Precautions In The World Will Not Save The
Lives Of Those Who Drive Automobiles Recklessly
Over Railroad Crossings.
When Approaching A Crossing Please Stop, Look, & Listen
We Are Doing Our Part. Wont You Do Yours ?
LONG ISLAND RAILROAD.

Surely this sign is big enough, you say. Yes, but how much better if all railroad signs were uniform. However, this is a good "safety first" sermon in itself



This sign is not as legible as one with plain letters, nor is it more decorative

Contrast this sign with that below. What if the bushes grew a little more?

Four signs used by France on its roads are shown above, with one of California's next to it. Note the message for target shooters

At the left is a Chicago Motor Club. The symbol of the organization is at the top of the sign

more if experience so teaches, semi-circular parts, any one of which may be placed above or below the directional sign, and these will indicate a road crossing, a railroad crossing or a sharp curve. A directional sign will be placed above these latter signs and will have on them the name of the town which is being approached or left behind, the mileage and the arrow indicating direction will be a part of the end of the sign. These letters will be 5 in. high. These directional signs may also give such information as "STEEP HILL" or "DANGER—DRIVE SLOW." If danger impends, the whole may be surmounted by a red ball, which if necessary should be illuminated at night.

To show how flexible such a system is, assume a road condition like the following: A road approaching Elgin, Ill., and 17 miles away, with a very steep hill, at the top of which is a sharp turn and a railroad crossing. The sign telling this story is shown. A sign such as this one, though telling more than would ordinarily be the case, would cost no more than $8 or $10, variation in price to be expected, depending upon the location.

BUFFALO DEALERS ACTIVE

Buffalo, May 13—Plans for the most active year's work in the history of the Buffalo Automobile Dealers' Association were made at the annual meeting last Monday. These directors were elected:

John J. Gibson, Gibson Motor Car Co.; E. H. Baker, Cole Motor Car Co.; Frederick Eaton, Oakland Distributing Co.; Charles C. Kane, Kane-Cadillac Co.; A. W. Haile, Haile Motor Car Co.; John A. Cramer, Cramer Motor Car Co., and E. A. Bull, Pierce-Arrow Sales Co. Officers will be elected later.

Following the annual meeting Mr. Kane gave to MOTOR AGE his views of the 1919 motor season and prospects, as follows:

"Business now in hand and additional prospects point to the most successful season in the history of the industry. There are many reasons for this. First, the country has plenty of money and, realizing the value of the automobile, is going to invest no small part of its wealth in motor cars. Many prospective buyers delayed purchases last season because of the gasless Sunday and other war restrictions. They are ready to buy now. Reunited families are going to purchase thousands of cars, and a mild winter, too, helped stimulate early season buying.

"Unless factory labor troubles seriously interfere, I am sure the 1919 season will be the greatest in the history of the motor industry."

AMBU TROUBLE SHOOTER MOVES

Chicago, May 13—On May 1 the American Bureau of Engineering, maker of the Ambu Electric Trouble Shooter, moved its offices and stock rooms to the motor row.

DIRECT FACTORY SERVICE

Detroit, May 9—Sales and service of the Acason motor trucks will be handled direct by the factory. The sale of Acason trucks at retail in Detroit and wholesale for Michigan will be handled by a special department of the factory which will be in charge of H. P. Mill

Build Airplanes Like Dollar Watches

To Be Successful, Must Produce on Quantity Basis—Ingersoll Instead of Swiss

CHICAGO, May 9—Before we can call the airplane commercially successful we must go from the Swiss watch type of construction to an Ingersoll watch type. That is, we must make our future planes of more rugged construction on a quantity basis, and correspondingly cheaper. This was the high spot in the talk presented to the Midwest Section of the Society of Automotive Engineers this evening by Wm. B. Stout of the United Aircraft Corp., New York.

In his talk on aviation, Mr. Stout said: "In judging the airplane of today we must hark back to the equivalent days of the motor car, when the latter was undeveloped and an expensive proposition as the airplane is today. While we have built planes in quantity, we have not designed in quantities. At the time of the war we had to take what we had at that time and develop it. We had no knowledge of materials other than amateurish material. But with the war we have developed materials, constructions and the production end of aircraft. Good engines have been developed, possibly not in the right size, but good enough for this stage of development. Now we are coming to the point where we must have greater safety than with the war machines, a place to land on small fields and at slower speeds."

Limitations of Design

Mr. Stout told further of the achievements of the wireless telephone as regards aviation, particularly in policing aerial routes and keeping the pilot informed of his location and weather conditions ahead. The speaker, in taking up the subjects of parasite resistance and lift-drift ratios, supplemented his talk with blackboard illustrations. He said the lift-drift ratio of the best machines is about 8.4—that is, 8 lbs. can be carried for every pound of propeller pull. This means a limitation of loads to be carried and fuel in proportion to horsepower. If a machine can be developed with a low enough parasite resistance, so that the lift-drift ratio is about 10 or plus, then, if we are lucky and have a calm day, we might be able to fly from Halifax to Ireland. As yet we have not produced any such machine."

Steam as an adjunct in the proper handling of kerosene as engine fuel constituted the major portion of the "Development in Burning Kerosene as Motor Fuel," presented by Otto E. Swekely, chief engineer and production manager of the Velie Motors Co., Moline, Ill. The author dwelt particularly on the experiments and research work done by this concern in using kerosene with its tractor engine. Increased volumetric efficiency, Mr. Swekely said, has been developed by means of a fairly successful method, consisting of the vaporization of the kerosene and the assumed drying in connection with the super-heated steam and fuel washing. This paper will be discussed at the next meeting.

Following are the new officers of the Midwest Section elected at this meeting: Chairman, Dent Parret, president, the Parret Tractor Co.; treasurer, Francis W. Parker, Jr., of Parker & Carter, patent attorneys; and secretary, C. S. Rieman, of the Elgin Motor Car Co.

ESTABLISHES LANDING FIELDS

Washington, D. C., May 9—The Air Service of the U. S. Army has inaugurated a plan to establish landing fields in all parts of the United States in co-operation with municipalities, according to announcement by Maj. Gen. C. T. Menoher, and has issued specifications which are in accord with the army regulations. Together with this announcement, the Air Service states that it has already designated 32 cities and towns from the Atlantic to the Pacific where it hopes to secure the aid of the municipalities to establish and organize a national system of air lanes. Landing fields will be of four classes.

The Air Service will select landing fields in co-operation with municipal representatives. Neither the Air Service nor the Postoffice Department will deal with any private associations in this matter.

At present the Government will co-operate only in the establishment of municipal flying fields at the cities where the Postoffice Department establishes aerial mail stations, or where the Air Service cross country routes require intermediate stations. The following cities have already been designated and flying fields will be built at each:

Boston, Mass.	Columbus, Ohio
New York City, N. Y.	Tucson, Ariz.
Richmond, Va.	Phoenix, Ariz.
Raleigh, N. C.	Yuma, Ariz.
Columbia, S. C.	Bakersfield, Cal.
Augusta, Ga.	Fresno, Cal.
Macon, Ga.	Buffalo, N. Y.
Atlanta, Ga.	Syracuse, N. Y.
Kissimmee, Fla.	Albany, N. Y.
Mobile, Ala.	Columbus, N. M.
New Orleans, La.	Kansas City, Mo.
Baton Rouge, La.	Oklahoma City, Okla.
Beaumont, Texas	Uniontown, Pa.
Flatonia, Texas	Daytona, Fla.
El Paso, Texas	Cleveland, Ohio
Texarkana, Texas	Chicago, Ill.

Although the government is confining itself to the establishment of these municipal landing fields, there is no restriction on other landing fields at cities and towns where local conditions or local initiative warrant it. The Government will furnish an expeditionary steel hangar to be erected at the expense of the municipality.

It is understood also that the landing fields will be prepared at the expense of the municipality, which will also bear the expense incurred in the procurement of personnel and the maintenance of the field and equipment exclusive of airplanes.

CHICAGO AIRCRAFT BRANCH

Lynn V. Blankman has been appointed manager of the central west territory for the United Aircraft Engineering Corp., New York. His headquarters are at 514 Westminster Building, Monroe and Dearborn streets, Chicago.

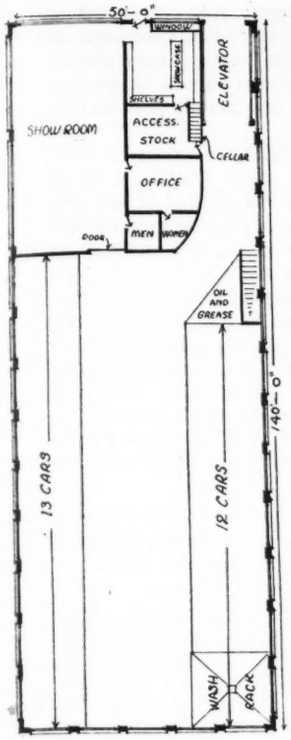


Fig. A

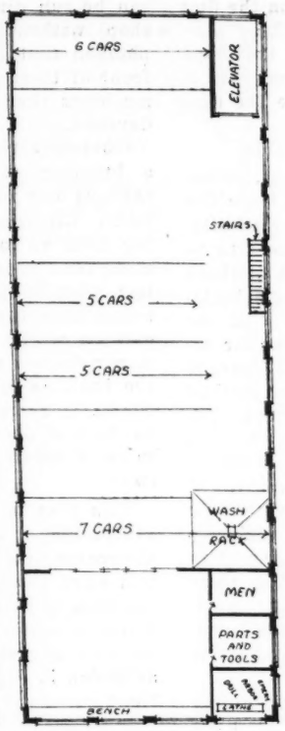


Fig. B

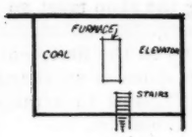


Fig. C

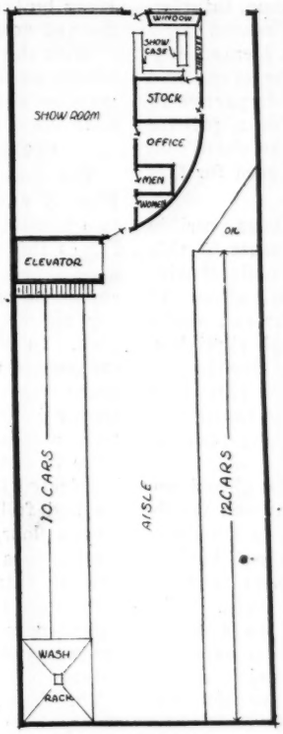


Fig. D

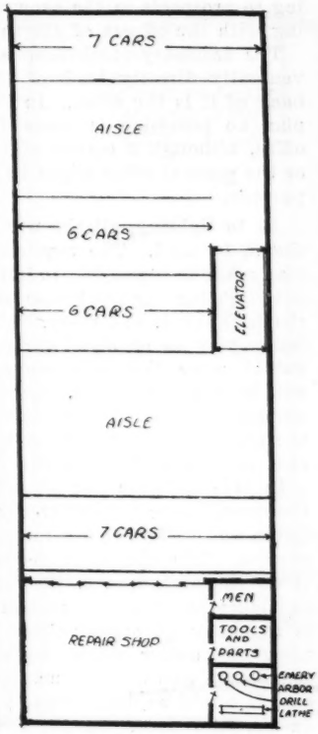


Fig. E

Standard Layout for 50 Ft. Garage

Plans Can Be Applied to Any Depth and Corner or Inside Location

THIS plan should be of extreme general interest, since it is for a complete dealer plant for a plot of about 50 ft. width and any depth. It is for an inside location but is almost equally suitable for a corner. It may be adapted to a building of one or more stories as desired.

The standard layout is shown in Figs. A, B and C, with variations in succeeding figures.

When a man glances at the ground floor plan, Fig. A, he is likely to exclaim, "That's just what I want only you have put the entrance at the side and also used the entrance as the elevator shaft."

This has been done for very good reasons. It is desirable to have the showroom, accessory store, stock room, offices and toilets in one unit and not scattered each side of an entrance driveway, and for convenience let us call this unit the showroom unit, to distinguish it from the garage unit and shop unit.

Showroom a Unit

Now, if the showroom unit is split up, steps are wasted by the various members of the business, since there is more or less traffic between the different rooms in this unit. Also it is extra trouble for a customer to step across the driveway from showroom to store or vice versa. And it is good merchandising to make the customer's path as smooth as possible even to such a small detail as an easy-opening front door, a door which opens inward, by the way.

Furthermore when showroom and store are adjacent the one is more apt to bring customers to the other. In addition a single unbroken expanse of window space is more effective and more attractive.

The objections are slight. The first and most usual is that most entrances are in the center and in advocating the superiority of the driveway at the side there is the inertia of custom to be overcome. But the only real objection is that it is awkward to reach the garage aisle—since it is usually in the center, but a glance at the plan, Fig. A or Fig. C, will show it is very easy to avoid this difficulty.

Complete dealer plant
Plot 50 by 140 ft.
Corner of inside location
One or two stories

The elevator is placed in the entrance driveway, because this gives access direct to the street and because it utilizes driveway space. If the elevator were located any other place, there would be just that much less first floor space for other purposes, not to mention extra space taken up in the approach to the elevator. Of course, use of the entrance is prevented when the elevator is in operation. Alternative locations for the elevator are shown in Figs. D and E, first and second floor plans respectively.

In Fig. D the elevator is placed at the rear of the showroom, and it may be reached directly from the street without any maneuvering, thanks to the curved outline of the showroom unit. Except for this curve this unit is much the same as the one in Fig. A.

Fig. E shows a second floor plan with still another elevator location. A car can be driven off of either end of the elevator to either aisle or to the shop. This position also is directly in line with the entrance of the first floor.

Accessory Store Separate

Referring again to Fig. A, it is seen that practically every room is an unbroken rectangle and that each unit is a rectangle. There is the showroom unit at the front, the garage unit and the shop unit. If only a one-story building is desired, the shop unit can be put at the rear of the first floor.

The accessory store is separate from the showroom and yet so close to it that one man can take care of both if necessary. Many dealers feel that they should combine accessory store and showroom to save labor, but this is objectionable, because the two departments look much better separate than they do together, and customers in the accessory store may prove distract-

ing to prospects in the showroom, interfering with the efforts of the salesmen.

The accessory stockroom is located conveniently directly back of the store, and back of it is the office. In this particular plan no provision is made for a private office, although a corner of the showroom or the general office might be used for this purpose.

As to lighting, all the windows possible should be used. The requirements of this plan made it impossible to have direct window lighting for stockroom and office. If the building is one story, light and ventilation may be obtained through skylights, but if more than one story, dependence will have to be placed on glass partitions separating these rooms from the showroom, the glass in the stockroom being translucent instead of transparent.

In this instance the shop is placed on the second floor for better light and ventilation and to be further removed from the curious. The disadvantage in not having it on the first floor is that there may be considerable running back and forth. This is a matter of organization. In a small town the owner might be shop superintendent as well as sales manager, in which case it would be desirable to have the shop on the first floor. In the case of a one-story building the shop must go on the first floor of necessity.

With the shop on the first floor, the shape of the storage space is so changed that it may be advantageous to arrange the cars with the rows crosswise.

Crosswise Parking Preferable

The first and second floor plans, either Figs. A and D or B and E, illustrate the two methods of arranging cars for a building of this width. The arrangement to be used depends on conditions. Both methods should be carefully considered for a building approximating the dimensions of the plan. In Fig. A, for example, the car arrangement was chosen because the garage space was not long enough for the method shown in Fig. B. Be it understood that from a space economy standpoint there is little to choose between the two, so which is selected is a matter of convenience. If we had followed this arrangement on the second floor, we would have had difficulty storing cars abreast of the elevator and in gaining entrance to the shop. Also more space would have been required for the elevator approach. So, all things considered, the crosswise arrangement is preferable here.

The shop is closed by a series of sliding doors, these being employed so that a car can be run directly into any point of the shop without any maneuvering. It is planned that the row of cars directly in front of these doors should be made up of machines that are usually out during the daytime.

Obviously this layout may be used for a building of any length with slight changes only in the method of car arrangement. Likewise it may be used for a building from 40 to 55 ft. in breadth. At the same time it is not advisable to build on less than 50 ft.; otherwise the aisle between the cars will be too narrow. If small cars are stored on this floor, a 45 ft. width is permissible although not advisable. If the building is wider than 55 or perhaps 60 ft., if extremely large cars are stored on the first floor, then it becomes advisable to use a different plan as will be explained later.

This plan is quite suitable for a corner except that it is possible to re-arrange the showroom unit so that the smaller rooms will have their own windows. Otherwise the plan is O. K. for a corner. A garage entrance can be placed at the side, and the elevator also might be shifted to the side as shown in Fig. D, entirely eliminates the front driveway so that the full frontage may be used for accessory and car display.

Garage Planning

Service Station Arrangements

No. 47

Suggestions for Remodeling Front

Q—I would like a suggestion for remodeling the front of my garage for show room, office and accessory stock. The space to be used is 31 ft. deep, and 55 ft. wide. I expect to put in a full line of accessories. The attached photograph (not reproduced) shows the garage as it is now. I want the two small doors taken out and a private entrance made out of the middle doorway. I have a rear entrance for automobiles.—Elmwood Garage, Oak Park, Ill.

The plan and elevator reproduced are self-explanatory and very few alterations of a serious nature are required. Some new sections of terra cotta to extend the arch effect to the intermediate piers after the central piers are removed and some base sections of the same material will be required. A long, heavy "I" beam will also be needed to support the central section of the wall formerly carried on the two piers and to replace the steel support formerly above the doorway.

No. 48

Garage 100 Feet Square

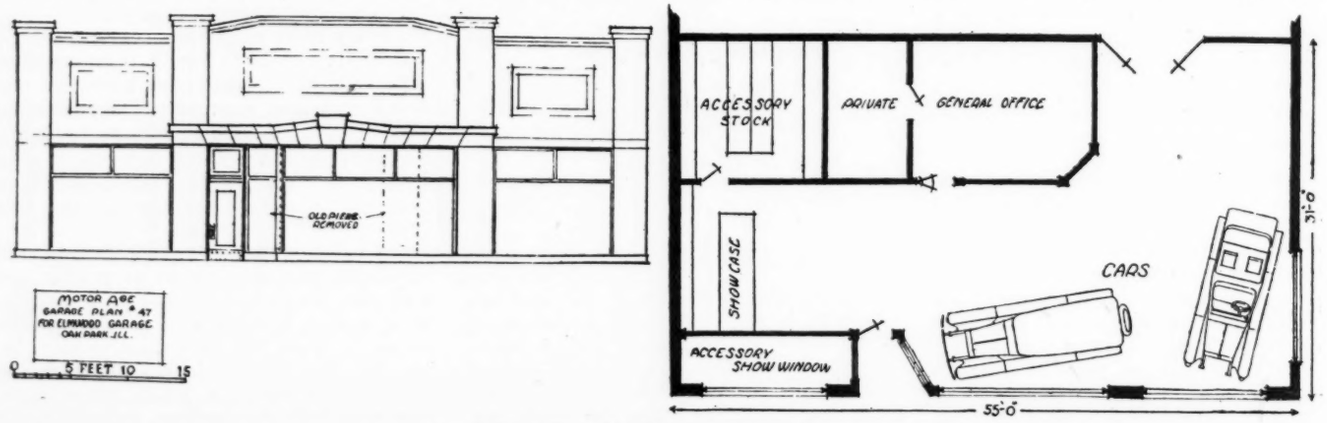
Q—I expect to erect a new garage building and would like suggestions and plans for a one-story brick building, with a large show room and accessory room, also wash rack. There will also be a repair department, and I need a good deal of room for storing cars. The lot is 100 ft. wide and 200 ft. long. It faces the main street on the south, with a street on the east, and an alley on the north. There is a vacant lot, 100 ft. by 200 ft. on the west. I would like to have a nice gas, oil and service station in front or in southeast corner.

I want the main entrance at the south, with a side entrance at the east, and with a back entrance or exit at the north. The material to be used in the building will be brick for the walls, with steel, and cement floor. Attached is rough sketch of the lot.—S. P. Coffey, McKinney, Tex.

You do not state whether you want to use the whole plot. To do so would give you a building far larger than we believe you require and so we drew the plan for a building 100 by 100 ft.

We were not certain about what you meant by a "gas, oil and service station" at the front, but concluded that you desired a gas and oil service station and accordingly we provided a room at the front from which these commodities can be sold either to cars in the garage or at the curb.

The repair shop is of moderate size. If you think that you need a larger one, it



Small garage remodeled to improve the front

may be extended further to the left. Or if you made it 5 ft. deeper it would accommodate two rows of cars of average size instead of one row.

What We Should Know

Motor Age is receiving many inquiries for garage plans which do not give sufficient information to permit an intelligent reply. There are certain things which should be known to lay out the proper plan for a garage, and inquiries are urged in asking for such plans to be sure to include the following information:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

And how much of an accessory department is anticipated.

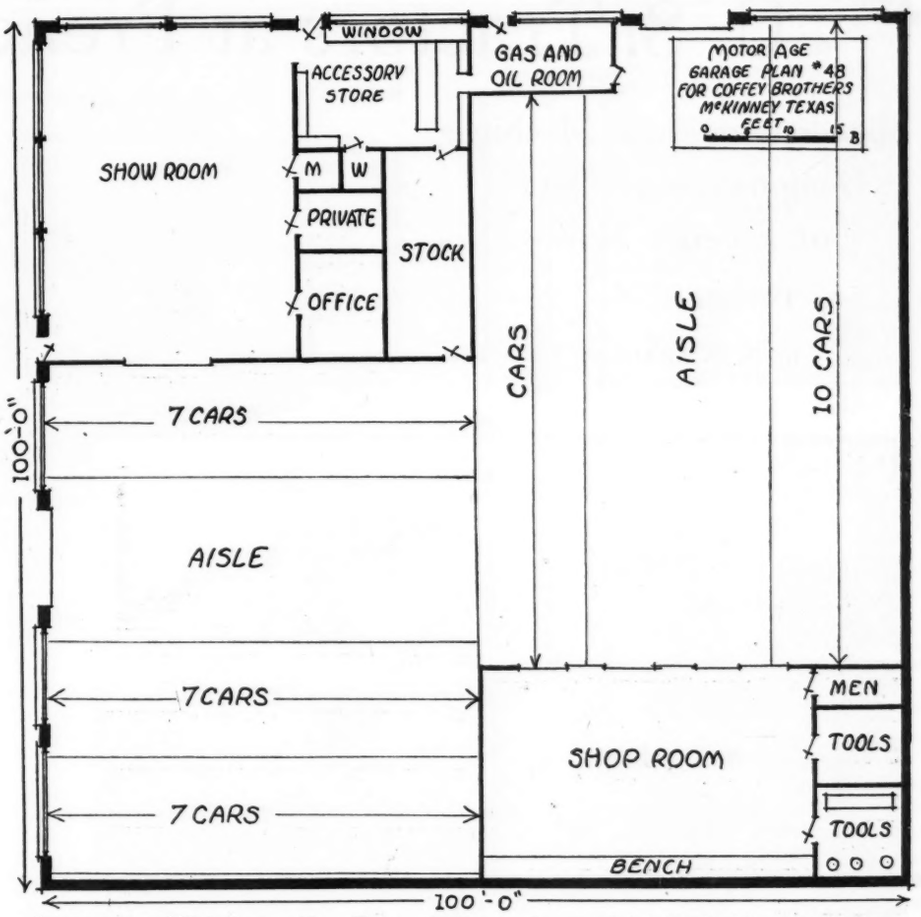
No. 49

Garage 44 by 145

Q—Attached is sketch showing garage which I expect to erect on a plot 44x145 ft. It is my idea to have a storage space, small repair department, including vulcanizing, requiring the services of about three men in both departments, wash stand, office, show room (I am taking on an agency), and a fair size stock of accessories, tires, tubes, etc. I am planning on storing about fifty cars on the monthly storage plan, besides having from four to five new cars in stock. The garage is to be one story with a two-story front. The second story is to be used as an apartment. The second story should be eliminated in your plan.—V. W. Marker, Harrisburg, Pa.

It is unfortunate that your lot is not just a trifle wider as everything is cramped all along the line. One could almost use the space to better advantage if the lot were 35 ft. wide and deep enough to give the same area it now has. The storage space as it now stands is of a capacity of twenty average cars.

The repair shop is the best part of the plan and should take care of everything that comes your way.



Square garage 100 feet on a side. The repairshop can be extended to the left for enlargement

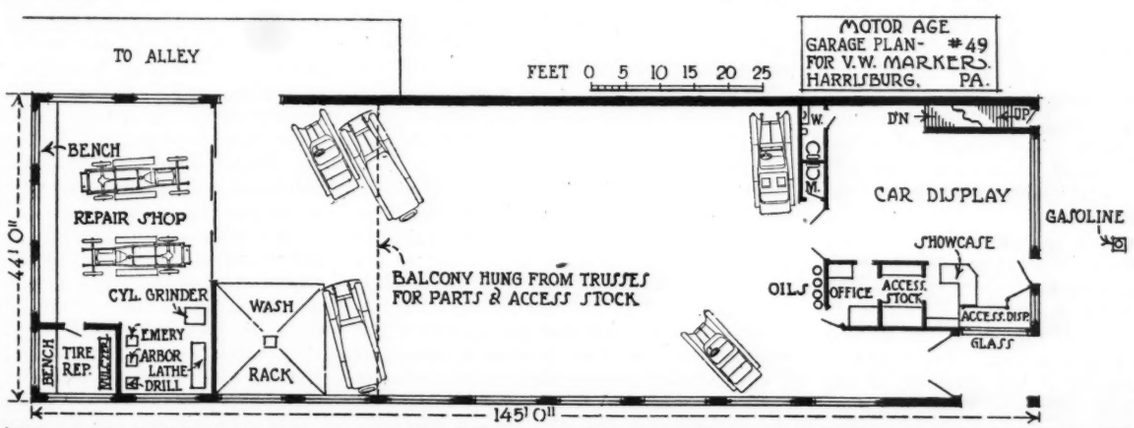
The car display room is not so much of a success but is as good as we think it could be made considering the space. Of course, there is no reason why 8 or 10 ft. could not be added to the depth, giving room for another car and doubling the office space. This would, however, add the same number of feet to the waste driveway space and we do not think the addition would be worth the cost, especially if you are counting on rentals. As it is, if you get a number of new cars in and your garage space is all rented, outside storage space can always be found for them or they might even be hung on the trusses until needed as is often done by large dealers.

We think the accessory arrangement is especially good as it allows the proprietor or his stenographer a view of the accessory store and even out to the gasoline pump in front of the building. Some advantage is taken of the waste driveway space by moving the doors back 10 ft. and giving this space to an accessory display window to catch the eye of an owner as he drives in.

If a heating plant is desired it can be located under the car display room and access had to it by a stairway under that leading to your apartment.

Floor space could be economized by using a balcony over the back part of the garage for parts, accessories and tire stock. This balcony to be reached by a stairway on hinges, and balanced by weights that could be raised out of the way when not in use.

If an arrangement of this sort is used, have your architect or engineer design your trusses accordingly.



Establishment 44 by 145 for storage, service, vulcanizing and sales. Owing to the small width the layout is somewhat cramped

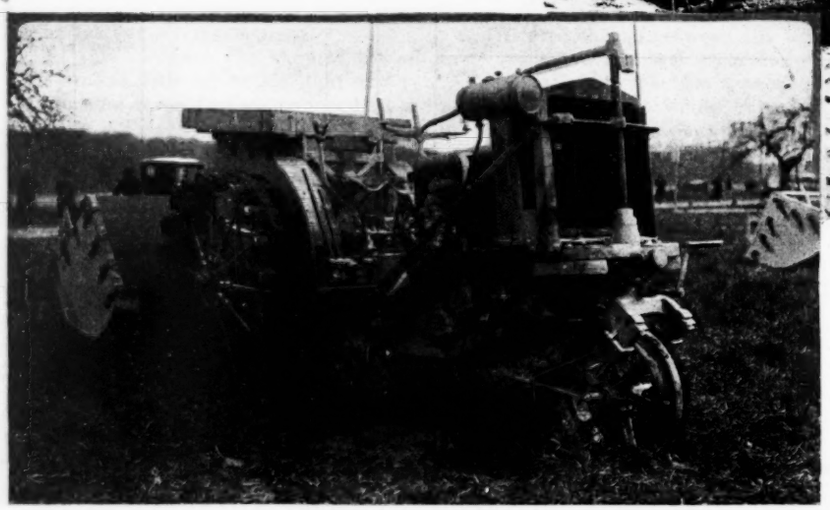
U. S. Tractors at French Exhibit

Sixteen American Machines Demonstrated—Details of Foreign Makes

In Two Parts—Part Two

By W. F. BRADLEY
Motor Age European Correspondent

The English Austin at French trials



This rotary plow type is built by a branch of the Schneider

Goutz tractor plowing in field

Overall dimensions of the Renault are 135 by 69 in. The endless tracks have a length of 64 in. in contact with the ground. The total weight of the machine is 6000 lb. and drawbul pull 5500 lb. Catalog price of the tractor is 28,000 francs, or $5,600, at nominal rate of exchange.

The new Delahaye is a complicated, well-built three-wheel self-contained plowing machine. The four-cylinder engine is the 4-ton truck type of 100 by 160-mm—3.9 by 6.29 in.—bore and stroke, placed across the machine. Two of the driving wheels are in tandem on the outside, and the third wheel, which is also a driver, is centered between the two others. Mounted transversely in the frame, with the radiator placed just back of the single wheel, is the four-cylinder engine, clutch and gearset, this latter providing two speeds ahead or reverse. The drive is taken to the wheels in tandem by two horizontal shafts, one running ahead and the other astern, to worm gearing, and finally by inclosed internal spur gears. The single wheel receives its drive more direct by a transverse shaft parallel with the crankshaft and inclosed internal gear.

The two wheels in tandem are steerers as well as drivers, but the turning angle is very small and does not appear to give anything more than is necessary to change position for a fresh furrow when the end of the ground is reached. The operator sits on the outside of the machine, in the position farthest removed from the furrow, and has two steering wheels on the top of a vertical column. The steering is naturally duplicated, there being two main steering arms and two fore and aft connecting rods. As the steering pivots are on the inside of the wheels and the fore and aft rods are on the outside, connection is made by carrying the connection through the wheel hub. On the opposite side a similar method is adopted when the starting crank is carried through the hub of the single driving wheel.

A four-bottom plow is mounted at each end of the machine, and each one can be raised mechanically by a winch. The single driving wheel has a diameter of 60 in. and a face width of 11.8 in. The two wheels in tandem have a width of 51 in. Total weight of the machine, with plows, is 8800 lb.

De Dion Bouton produces two types of cable plowing machines. One of these is rated at 50 hp. and has a four-cylinder engine of 4.8 by 5.9 in. bore and stroke; the smaller one, rated at 30 hp., has a four-cylinder engine of 3.9 by 5.5 bore and stroke. The method of operating is to place a tractor-winch at each end of the machine and to haul a double plow across the land. Each tractor has its engine in front, winding drum in the center and a small platform at the rear. The big tractor takes the drive to the rear wheels by transverse shafts and internal gears, exactly the same as on De Dion Bouton trucks, but the number of gears is reduced to two and reverse. A 15-mm. steel cable is used, having a length of 550 yd., with a breaking strain at 26,000 lb. The drawbar pull is 7000 lb. average, this allowing plowing to be carried out, in moderate ground, with a six-blade plow, to a depth of 9.8 in., giving a width of 70 in., at a speed of 2.3 to 2.8 m.p.h. With three blades, and plowing to a depth of 11.4 in., the width of land operated on is 47 in. Gasoline consumption is said to be 3 to 3¾ gal. per acre with a drawbar pull of 7000 lb., using a six-blade plow and plowing to a depth of 7 to 9½ in. Under these conditions two of the big machines working together will cover 12 acres per day of 10 hr.

The smaller De Dion Bouton machine differs from the larger by reason of the adoption of chain drive with only a single gear ahead and one reverse. The winding drum is provided with 440 yd. of 13-mm. steel cable, having a rupture point at 20,000 lb. The drawbar pull is 4400 lb. and the plowing speed 2.3 to 2.7 m.p.h.

The new tractor, for which the Gnome &

Rhone company is responsible, or rather will be responsible, for the exhibition model appears to be an experimental type built outside, is a four-wheel-drive type. At the trials a machine was shown with a twin-cylinder vertical engine, but it was explained that this will be replaced by a four-cylinder vertical slow-speed engine of 16-20 hp., water-cooled, with force feed lubrication. The tractor, which is of comparatively light weight, 2800 lb., is a very compact machine with engine forward, engine base and gearbox in one casting and drive taken to all four wheels. The machine has four speeds, two of which are calculated for use in the field and two when the tractor is employed on the road.

The Gnome & Rhone machine is marketed under the title of the Aurore. It is being sold at $2,400, which is a very low price compared with other and similar machines shown at the demonstrations. One of its features is the use of a detachable strake of a very simple and practical nature. This is in three sections for the entire circumference of the wheel and is attached by lugs on the inner face which pass through holes on the wheel rim and then are secured by a bolt. The entire set can be fitted in 5 min. and taken off in less than 2 min.

Filtz tractor in French demonstration

"Should Give Tractors More Attention"

Owners Make Trade Expensive, Says Distributer

OMAHA, NEB., April 23—"Men who are buying tractors are not giving them the attention they ought to have. This makes the tractor trade an expensive one to get and expensive to hold," says a tractor distributer who has been acquiring experience during the last year or two.

"The trouble seems to be that they are not watching lubrication carefully enough. Everybody in the tractor business seems to have gone crazy over the idea of burning kerosene. Manufacturers are building so-called kerosene-burning tractors. Farmers are buying them because they have been convinced that it is cheaper to burn kerosene than gasoline. This probably would be all right if at the same time the farmer understood that the ordinary tractor engine does not at the present time burn all the kerosene and that a certain portion of it slips by his piston rings and dilutes the oil in the crankcase.

Changing Crankcase Oil

"It has been our experience that whenever a farmer has a tractor which uses the splash system of lubrication, the oil in the crankcase ought to be changed at the close of every day's work. Too many farmers do not appear to understand this, or if they have been told they neglect it, with the result that they burn out the bearings and largely increase the expense for the distributer and dealer by making useless calls for service.

"This service problem on tractor sales is a serious one and is something which the distributer must handle in a different way. We have found that if we have service men, we can have the privilege of giving service to any extent that we are disposed to hand it out. Our service men have been called considerable distances for most trivial things. Nor do we think that the experience of other distributers has been different from ours. This is a condition which will have to be corrected because the margin on which the distributer of tractors must do business is not wide enough to permit his standing the expense, now that the number of tractors is increasing so largely in every territory.

"The only solution of the problem that we see is to pass the service along to the dealer and educate him to charge for it what it is worth. You may take it as a true statement that free service doesn't get results, and the dealer must make a charge for what he gives over and above the starting of the tractor and instructing the farmer how to operate it. This much, of course, he will have to do free. In this connection, we do not believe that the present discounts allowed dealers on tractor sales are sufficient to cover the cost of the service he must give and that tractor manufacturers must arrange to give him a larger discount. We believe something can be done along this line if the distributers will get together and talk over conditions.

"Up to the present time, we have not made it a condition on any of our sales contracts that the dealer shall carry anything extraordinary in the way of service equipment or a stock of repairs. However, the tractor business will develop along these lines just as the motor car business did and the distributer will be compelled to insist upon the dealer equipping himself to give adequate and prompt service. Another thing the motor car distributer who takes on tractors must learn is that he will be compelled to sell tractors through a separate sales organization. We do not believe the tractor business can be handled properly in any other way."

GOVERNMENT DISCUSSES FIRING AND QUITTING

"Not knowing how to do a job has two results: First—low efficiency and, second, quittance or discharge—labor turnover. Each of these operates to increase the cost of production. Both worker and employer pay a penalty for this condition, just as each would profit by its correction."

The above is one of the interesting statements in a vest-pocket bulletin entitled "Labor Turnover and Industrial Training," which has been issued by the U. S. Training Service of the Department of Labor. The pamphlet contains many other pointed observations of value to manufacturers and labor men, as well as to all others interested in modern economic questions.

In discussing the present enormous turnover in industry the bulletin says:

"It may be convenient to ascribe this excessive and burdensome labor turnover entirely to restlessness, instability, and perversity of the workers. * * * The truth is that labor turnover is not wholly or even largely the fault of the workers."

Only 10 Per Cent Lazy

The publication then goes on to tell of an illuminating study of the causes of discharges and quittances in a large manufacturing plant. But 10 per cent of the separations, it was found, were due to slacking, while 90 per cent were attributable to shortcomings and defects of one kind and another in the management of the plant. The special point which the bulletin makes in this connection is that industrial training conducted in the plant results in the worker being better fitted for his job. Hence he earns better wages, produces more for his employer, has a greater sense of self-respect, and remains at his task instead of periodically shifting from job to job.

The U. S. Training Service is devoting special attention to preparing courses in the proper methods of training in various industries so that interested manufacturers may be supplied with adequate material for operating training departments. Other pamphlets on training will be mailed to anyone addressing the service, care of the Department of Labor, Washington, D. C.

The Readers' Clearing House

Questions and Answers

Conducted by B. M. Ikert

Steam Viewed from Two Angles

Takes Up Cudgels for Flash Boilers

EDITOR MOTOR AGE—I invariably read with interest and always with profit your answers to inquiries. On page 35 in the first column of the March 20th issue Mr. W. H. Shedd of Pittsfield, Mass., asks some of the usual questions about the steam car. While not an engineer, I am audacious enough to differ with you in certain particulars. A portion of the public lost faith in the steam car years ago, but emphatically it can be said that it was not on account of boiler explosions. Flash boilers were in certain particulars defective and deficient, but to say that they blew up is to give the impression that they exploded with disastrous effect. That such could not have been the case is very apparent.

The number of foot pounds of energy contained in a boiler and the rapidity with which that energy can be liberated determines the potential destructiveness of the boiler in case of explosion. The flash boiler has the smallest water content of any type and the highest factor of safety, owing to its tubular construction. An explosion would be merely the splitting of a tube. The energy in the boiler (steam and hot water) would be liberated no faster than it could issue from the tubing at the point of rupture.

It is quite apparent that you have challenged what is unquestionably the least debatable quality possessed by the flash boiler. To blow up is the one thing a flash boiler cannot do in the ordinary sense. Present boilers of the drum type are theoretiaclly capable of much more disastrous explosions because of their greater water content, but as their weakest point is the tubes they have never exploded except in one or two cases under peculiar circumstances. Any boiler constructed entirely of tubing of small diameter is incapable of causing an "honest-to-goodness" explosion, as must be apparent to any one who has even a rudimentary knowledge of engineering.

Another statement made in reply to Mr. Shedd was that the flash boiler has no place in a steam car because of its inability to meet wide fluctuations in the demand for power. There are two ways of looking at this problem. One may insist that a boiler of great storage capacity is required and of rapid and instantaneous generation of small storage capacity but which is capable o~ rapid and instantanious generation of steam by reason of large heating surface, great burner capacity, small sub-division of water space and an adequate supply of feed water instantly available, the whole

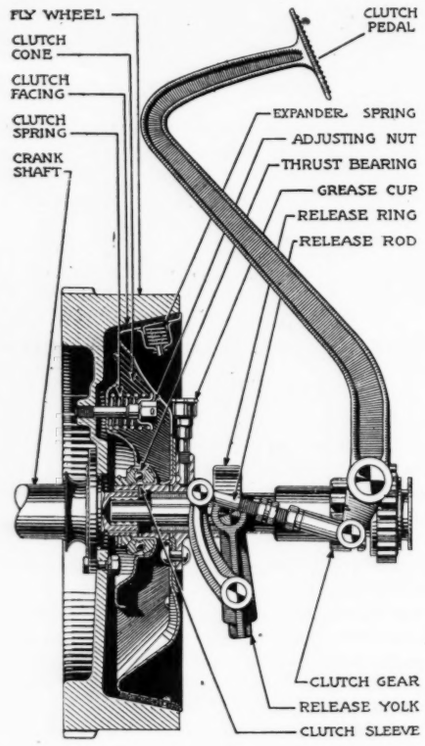


Fig. 1—Buick clutch assembly showing where adjustments are made

to be regulated sensitively and automatically so that the proper equilibrium of water, temperature and pressure will be maintained. It is clear that the first type mentioned is the familiar fire-tube or drum type and that the second is the so-called flash boiler. Those of us who have handled a flash boiler under the best conditions know that it possesses a considerable amount of reserve or stored power under the most favorable conditions. I want to express my belief that the flash boiler has never been given proper opportunity to show what it could do. In the early days flash boilers had little reserve, owing principally to improper control of the feed water supply, the temperature and the pressure. Thermostats, pressure regulators, needle valves, fuel and water strainers and all of the other devices employed were lamentably inadequate, mechanically imperfect and improperly designed. Turn our present-day engineers loose on the flash boiler and the writer believes a new and very different chapter could be written. Until we have had experience with the flash boiler so controlled that it will always contain the maximum amount of water possible without flooding, along with proper regulation of temperature and pressure, who dares to say that the type has no place in an automobile? Let us wait and give it a fair trial.

The writer has noticed an increasing interest in steam cars of late as evidenced by the queries in your columns. There are thousands of steam car users throughout the country who would welcome the addition of a department in your magazine devoted to answering the questions which are being asked in considerable volume about this form of motive power.—Chas. Edw. Prior, Jr., Hartford, Conn.

Editor's Note.—Our criticism was directed, not so much against the flash boiler, but against the feed water regulating mechanism.

Steam Power Plants

Q—Is any manufacturer planning to market a small steam motor car in the near future? If so, give some description of boiler and engine.

2—Would ordinary city water give satisfactory service in steam cars or do they require rain water?

3—Would water containing considerable mineral or mud do much damage if used only about 200 miles in one or two days if the boiler and water tank were then flushed out and refilled with good water?

4—Would a car propelled by the steam turbine referred to on page 13 of the April 17th issue require change speed gears like a gasoline car, or would it have sufficient torque at extremely slow speeds with only one gear ratio?

5—Does the steam power plant for airplanes referred to in the same piece use a turbine or a reciprocating engine?

6—How many revolutions per minute does the engine run?

7—Has it been flown?

8—What kind of fuel does it use?—Walter Catchings, Ft. Worth, Tex.

1—We have not heard of it.

2—Water with dissolved mineral salts in it will cause the boiler to scale. Twenty to 30 grains per gallon should be the limit of salinity.

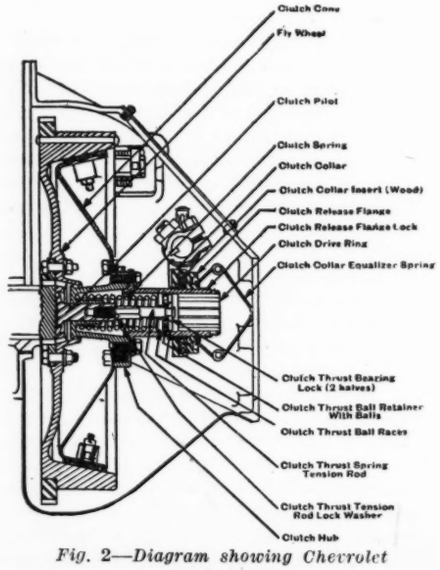


Fig. 2—Diagram showing Chevrolet clutch details

3—It is possible for a deposit to cause the boiler tubes to become red hot, blister and finally burst.

4—No gears would be necessary. A steam turbine can be as designed so that its torque will shear the blades of the rotor off when standing still.

5—Reciprocating engine.

6—2000 r.p.m.

7—No.

8—Kerosene or distillate.

Clutches

Remedying Dragging Clutch

Q—How can the clutch in the little Buick Four be remedied when it drags and the gears clash?—Clayton Hinkle, Unionville, Mo.

1—It is very probable that the leather is worn so that when the clutch pedal is pushed in the clutch is not withdrawn entirely from the cone, resulting in the clutch revolving after it is withdrawn. To remedy this either renew the leather, or make allowance for the wear by adjusting the nuts on the clutch gear, shown in Fig. 1.

Clutch Slipping Causes

Q—I have a new clutch which does not slip when seated but can not get it to seat properly every time I shift gears. What is the remedy?—Walter Hahn, Caney, Kan.

There are several things that may cause it. Mention is made of them here and then you can check up your clutch to see if the various parts are all right. The facing may be worn, the spring engaging inserts under the leather may not be pushing hard enough on the cone leather, the yokes and withdrawing levers may need oil, and the yoke may need adjustment.

Engines

Various Engine Queries

Q—Is the Continental engine used in the National six, the Jordan six, and the Roamer six the regular Continental Red Seal, or is it of different design, and if so in what respect does it differ?

2—What is the brake test horsepower of the Stutz 16-valve engine?

3—What ignition system is used?

4—What speed should a Stutz Bearcat make on a good paved road?

5—Does Roamer make a Deusenburg engine car, and does it use the same chassis as the six?

6—What price?

7—What type of sixteen-valve head would you recommend for use on a Ford racer, the chain-driven overhead camshaft or the type driven from the regular camshaft by pushrods?

8—On a Case six the horn does not blow well at slow speeds, while at high speeds it blows well. What is the cause and remedy of this? The battery is fully charged.—T. J. Babb, Port Lavaca, Tex.

1—So far as size of cylinders is concerned, yes, but every manufacturer of a car using a standard make of engine specifies certain little details that are not common and usual with others using the same make of engine. These three engines are the same size in cylinder dimensions, are made by the same manufacturer, most of the parts are identical, yet they differ in some respects. For instance, some use the 7-W engine of Continental make, while the Roamer has the 9-M, with balanced crankshaft and Bosch magneto ignition. The Roamer is not 3¾ by 5¼ in. but 3½ by 5¼ in., the same as the other makes mentioned. Usually there is some difference in the crankcase, the arms or the back end taking the transmission housing or some other minor part.

TO assist readers in obtaining as a unit all information contained in this department on a certain subject MOTOR AGE segregates inquiries into divisions of allied nature. Questions pertaining to engines are answered under that head, and so on.

STEAM CAR QUERIES

C. E. Prior, Jr.....Hartford, Conn.
Walter Catchings.....Fort Worth, Tex.

CLUTCHES

Clayton Hinkle.....Unionville, Mo.
Walter Hahn.....Caney, Ky.

ENGINES

T. J. Babb.....Port Lavaca, Tex.
R. R. Crawford.....New Haven, Conn.
Reader.....Canton, Kan.

THE ELECTRIC SYSTEM

Gerald Baldwin.....Butte, Mont.
Frank Davidson.....Detroit
Walter Hahn.....Caney, Ky.
Perry C. Bell.....Sidney, Neb.
Allister Johnson.....Montclair, N. J.
Howard Hanagan.....Columbus, Ill.
Reader.....Canton, Kan.
Clayton Hinkle.....Unionville, Mo.
Donald Bowie.....Aspen, Md.
Carson M. Dee.....San Luis Obispo, Cal.
W. D. Link.....Omak, Wash.
George W. Turner.....Erie, Ill.
M. M. Eley.....Union Spring, Ala.
George Kraus.....Mogollon, N. M.

CARBURETION

Clyde Graves.....Fort Worth, Tex.
C. G. McClellan.....Nakin, Ohio
P. E. W.....Temple, Tex.
Reader.....Atlanta, Ga.

LUBRICATION

R. R. Crawford.....New Haven, Conn.
Walter Hahn.....Caney, Ky.

MISCELLANEOUS

C. G. McClellan.....Nakin, Ohio
J. H. Rappold.....Newport News, Va.
William Jennings.....Altamont, Kan.
Reader.....Greensboro, N. C.
E. N. Quinn.....Madison, Wis.

No communication without the writer's name and address will be answered in these columns.

2—The Stutz engine used in the Bearcat will show something like 85 or 90 hp. on a brake test. Engines of the same size, model and make will vary to some extent.

3—This is a special Delco of the double variety, called double ignition and little used except on this make of car.

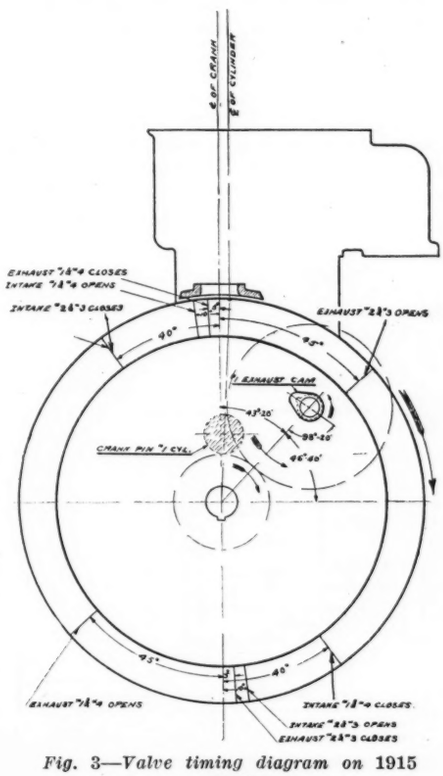


Fig. 3—Valve timing diagram on 1915 Regal

4—On a good stretch of well-laid concrete pavement, where there is no obstruction, this car should do about 80 m.p.h. if in good condition.

5—Yes and no. Such a model is scheduled, but while the Duesenberg factory was confined wholly to war work it was impossible to procure powerplants of this make. Now, however, the way is clear to go ahead with making cars with this engine, and this is under way, although in limited quantities. The same chassis is used for both the Duesenberg and the Continental-equipped cars. The Roamer cars that were equipped with the Duesenberg engine had powerplants of 3⅞ in. bore by 6 in. stroke, with six cylinders forming the unit.

6—The price last quoted was $3,785, f. o. b. Kalamazoo, Mich.

7—We cannot recommend one type over another. We know of cases where both are giving satisfaction. In one you do away with some of the valve mechanism, but have the chain to look after, while in the other the ease of installation is, perhaps, not so pronounced. It is a question up to the owner.

8—It would be perfectly natural that the current direct from the generator would be greater than that from the battery and the higher the engine speeds the greater the current. Possibly there is a loose battery connection somewhere and all the battery current is not finding its way to the horn. In such a case it is well to adjust the horn to the battery, and in this case the most effective results will be obtained.

Regal Timing Diagram

Q—Publish illustration of the Liberty engine that is used on trucks and cars the same as the airplanes.

2—What are flywheel marks on a Regal 1915?—A Reader, Canton, Kan.

1—The Liberty engine is used on airplanes only. One of the standardized Army trucks was called the Liberty truck but its engine was called the class B. Pictures of engines that are adaptations of this truck have appeared in recent issues of MOTOR AGE. Neither engine was used on cars.

2—The marks on the flywheel with reference to the position of the valves is shown in Fig. 3.

Overhead Valve Adjustments

Lawrence, Kan.—Editor MOTOR AGE—I am an owner of a Buick E 45 and am much interested in the theory and practice of the automobile. In your issue of Feb. 20th, page 38, there is an article on "Overhead Valve Adjustment." The writer has apparently made some careful experiments. His conclusions, if correct, overthrow the theories of most writers on this subject and deserve greater emphasis. If I understand him correctly increased heat tends to widen the "air gap," or clearance between end of rocker arm and the end of the valve stem. He says that if the valve will seat when cold, it will seat when hot. He seems to draw this conclusion from the fact that heat will expand the cylinder more than the push rod. The Buick Manual, Dyke's Encyclopædia, and Page in his various works recommend leaving a clearance of from .003 to .005 of an inch when cold, in order that when the valve stems expand with the heat, the valves may still be allowed to seat. In brief the question is this: Does increased heat tend to widen or close the air gap? The question is one of much practical importance in making proper adjustments.

I have been in the practice of adjusting the tappets when the engine is cold and leaving from .004 to .005 of an inch clearance. If the writer of your article is correct in his conclusions, I should not leave more than .001 of an inch or even less. If the statement in the Buick Manual

is correct the latter adjustment would not permit the valve to seat when hot, while if the statement by your writer is correct, there would be adequate clearance when hot.

I am not at all sure but the writer of the article was entirely right and the other writers wrong. I made a rough experiment recently which would seem to indicate that such is the case. The Buick manual advises an air gap of .005 of an inch. I adjusted the push rods when the engine was cold to a scant .003 of an inch. I then drove 50 miles over rather heavy roads and while the engine was still hot I found I could easily turn by hand all the pushrods while the motor was running, thus showing that the clearance was still ample. This test would indicate the writer of your article was correct, or at any rate that the usual clearance is too much.

The question is to my mind one of considerable practical importance for engineers and repairmen. I am sure that the big majority go on the assumption that increased heat tends to close the air gap. If the reverse is true, then the proper adjustment would be to set the pushrods at a snug fit when the engine is cold. I should be glad to see a full discussion of the matter in MOTOR AGE.—A Reader.

The article to which the writer refers compared the inclosed overhead valve push-rods to the outside overhead push-rods. The inclosed type will heat more than the outside rods and for this reason the difference in expansion of the block and rods will be less and the clearance can be accordingly less.

The Electric System

Horn Does Not Blow

Q—On a Case six the horn does not blow well at slow speeds, while at high speeds it blows well. What is the cause and remedy of this? The battery is fully charged.—T. J. Babb, Port Lavaca, Tex.

It would be perfectly natural that the current direct from the generator would be greater than that from the battery and the higher the engine speeds the greater the current. Possibly there is a loose battery connection somewhere and all the battery current is not finding its way to the horn. In such a case it is well to adjust the horn to the battery, and in this case the most effective results will be obtained.

Wiring Diagram of Hudson 33

Q—Has celluloid been used to any extent as an insulation for storage batteries? Is it practical? If not, why?

2—In designing a storage battery is there any non-technical way of calculating the size of plates and surface area for different amp. hour capacities?

3—I have been told that a person working around batteries contracts a cold easily and there is a certain serum which injected into the arm prevents colds due to this cause. What is the name of the serum?

4—Why is the battery breaker on a Bosch dual magneto set 10° later than the magneto breaker?

5—Show diagram for connecting battery to electrical system on 1913 Hudson.

6—Will this same hook up work on all cars using this type of battery?

7—Have had some trouble in repairing motorcycle batteries. I have put new positives with old negatives that looked good and tore this job down twice for the reason that it would discharge not being used. I could not find any shorts or trouble to cause it. Do you think the reason is faulty workmanship, or what?—Gerald Baldwin, Butte, Mont.

1—Celluloid is being used more and more for battery insulation. It is practical and serviceable.

2—It is rather difficult to give a good general rule for plate capacity, as this is somewhat dependent upon the plate thickness. But taking an Exide plate as example the dimensions of which are 5¼ in. by 5 29/32 in. which in one hour can give 1.9 amp. This is 31.1 sq. in. or about 1 amp. from each 16.35 sq. in.

3—If the battery repair is well ventilated as it should be, there is no reason why battery repair man should be more susceptible to colds than any other person. We have heard of such serum.

4—The reason for this retarded setting is because there is a lag in the time element for the battery to build up. This lag is not so much in evidence when the exciting current comes from the magneto coils.

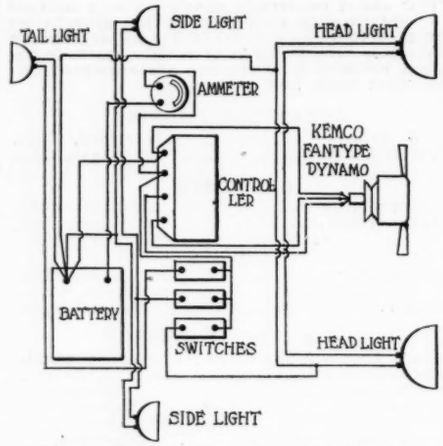


Fig. 5—Kemco system as made for Fords

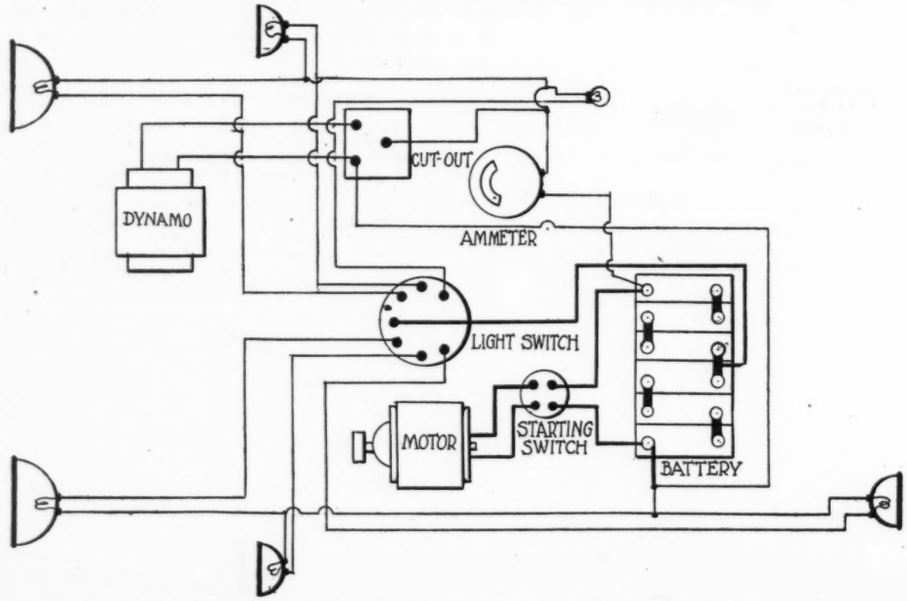


Fig. 4—Disco electric system, illustrating connections for ammeter

5—The diagram for this system is shown in Fig. 8.

6—No. The voltage for this system is 24 for starting and all systems are not like that.

7—Negative plates do not show the effects of time as readily as the positive plates and there are many cases where batteries have been overhauled, having new positive plates installed because they looked rather worn, while the negative plates were left as they were, because they did not show any signs of wear.

Kemco Ford System

Q—Publish wiring diagram with ammeter connections of the Kemco starting and lighting system as used on a Ford.

2—Will a 6-volt 13-plate Detroit battery run this engine? The generator is a fan type and has three wires protruding, also a four-point automatic cut-out.

3—Is it safe to ground battery to chassis?

4—How can I tell which is the ground wire from the battery?—Frank Davison, Detroit.

1—This system is shown in Fig. 5.

2—This generator is not designed to run a starting system. It is for lighting purposes only, as the diagram shows.

3—No, do not ground the battery, for it is not a grounded system.

4—See 3.

May Be Faulty Cut-Out

Q—The lights on my Chevrolet 490 1917 are dim when the car is idle, but when it runs they are very strong, but get very poor when the engine slows. The generator registers well on ammeter and batteries are fully charged, commutator is clean and smooth, brushes O. K. The bulbs burn out quickly, first smoking. What is the remedy?—Walter Hahn, Caney, Kan.

1—This is a case of the regulator and cut-out not regulating, and not working as they should. After the generator has been cut in on the line, the full voltage is impressed on the bulbs and this burns them out. This should be attended to promptly as the battery will be ruined from excessive charging. Remove the cut-out and shorten the generator terminals with a piece of copper wire. Have the cut-out repaired by a competent service man. During this time the lights should be burned as little as possible, and hand crank the engine. The cut-out was illustrated April 17.

Generator Reverses Polarity

Q—Publish wiring diagram of a Coey Flyer model 5 built in 1915 with a Disco 12-volt starter-generator model 26A and a Ward-Leonard automatic cut-out type C. D.

2—Show how to connect with an ammeter, between battery and automatic cut-out. This generator changes poles till I cannot connect a battery but seems to have spark when the posts are shorted.—Perry C. Bell, Sidney, Neb.

1—This is the standard Disco wiring for 12 volt systems and is shown in Fig. 4.

2—The ammeter is included in the diagram. We do not quite understand you when you say that the generator changes poles. Do you mean that the generator changes its polarity intermittently. If so the generator must be of the compound type, and the series field is connected wrong end to, so that in building up to a certain point the series field overcomes the shunt field and thus reverses the polarity. Of course a differential generator works this way, but the series field is proportioned to the shunt field so that it never overpowers the shunt.

Dixie Magneto Principle

Q—Explain the difference between the revolving armature magneto and the Splitdorf.

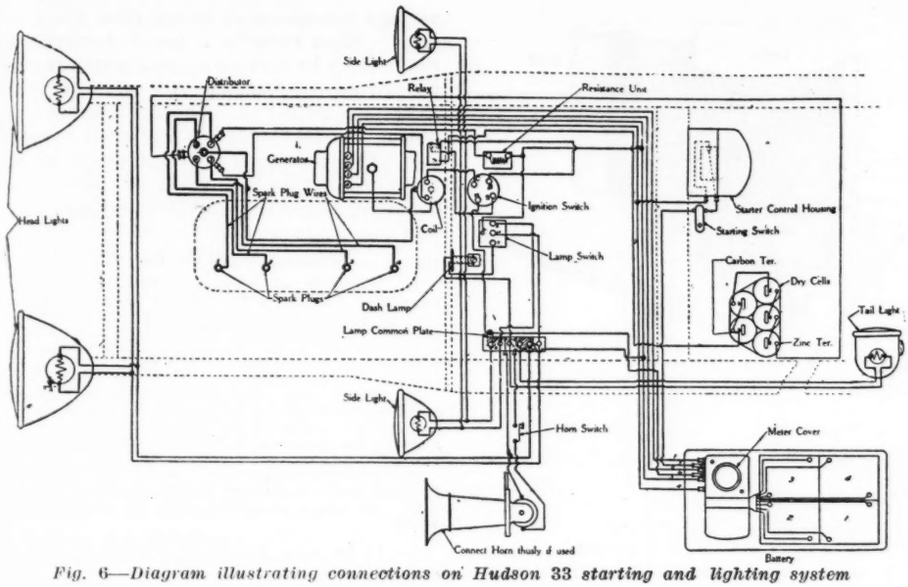


Fig. 6—Diagram illustrating connections on Hudson 33 starting and lighting system

2—How can the Splitdorf say that the winding stays still and the breaker stays still? I have read the booklet on the magneto but still cannot see how the current gets through the winding. I would like to see a good picture to illustrate how it is done.—Allister Johnson, Montclair, N. J.

1—Electric generators produce electricity because the wires of the armature cut through the lines of force of the magnetic field. Now, whether the armature moves through the field or whether the field moves through the armature wires, the result is just the same. The latter method is the principle upon which the Splitdorf magneto works.

2—The Mason principle, on which the Dixie operates, is shown in Fig. 7. The magnet has two rotating polar extremities N S, which are always of the same polarity, never reversing. These poles are in practical contact with the inner cheeks of the permanent magnet, all air gaps being eliminated. Together with the U-shaped magnet, they form a magnet with rotating ends.

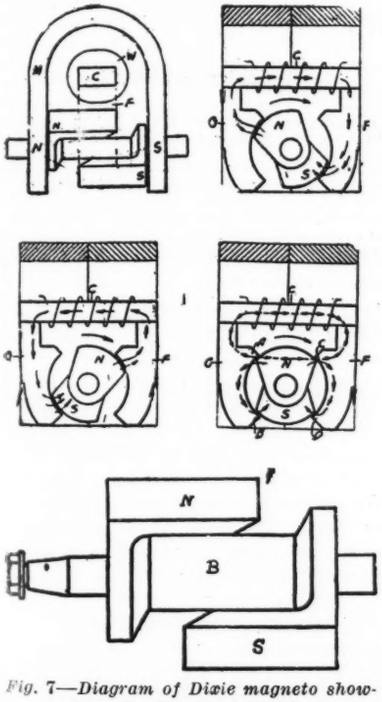


Fig. 7—Diagram of Dixie magneto showing the Mason principle

Positioned at right angle to the rotating poles or ends of a field structure consisting of laminated pole pieces, carrying across their top a laminated core which carries the windings. When N is opposite G, the flux flows from one pole N of the magnet to G and through the core C to F, this action corresponding to what happens in the armature type.

In Fig. 7 the pole N has moved over to F and the direction of the flow of flux is reversed, it now flowing from F through C to G.

Fig. 7 represents the rotating poles occupying a midway position between that already shown. Here the field pieces F and G are magnetically short-circuited, as it were, thereby completely scavenging stray lines of flux out of the core C.

The great difference between the Dixie and the "armature" type is in the fact that the rotating poles in the Dixie do not reverse their polarity at any time, consequently the lag due to the magnetic reluctance in this part is eliminated. This partly accounts for the high efficiency of the Dixie at low speeds. In the Dixie the windings are actually never in the field. The flux is shot through them, as described, producing a hot "snappy" spark of peculiar and highly efficient ignitrng power, owing to the quick break and absolute reversal of the flux of each revolution.

With the armature type machine it is the central core or part actually enclosed by the winding that is laminated, as the ends adjacent the windings must be solid. In the Dixie type, not only the core C, around which the wire is wound, is laminated, but also the pole shoes G and F, consequently all parts of magneto subject to reversal of flux are "laminated."

The Dixie rotating element, or armature construction, consists of two pieces of cast iron, Fig. 7 and a brass block (B) placed between them. There are no rotating wires. The figure also shows more clearly how they are positioned between the poles of the magnets. On the 4 and 6 cylinder magneto there are 2—N & S—poles, and on the 8 and 12 cylinder magneto there are 4.

Operating of Starter

Q—I have a 1915 model K Hupmobile car No. 54687 equipped with a Westinghouse single unit 12-volt system. The starter works fine but the generator will not keep the battery charged, though I have had the commutator tuned up and new brushes put in. Is there any way of adjusting the third brush to make it charge more?

2—How many wires run from this motor generator?

3—Would like to see a wiring diagram of this car?

4—When the engine has started I then throw on the starter switch so the charging current will flow to the battery. Do you think this will hurt the generator?—Howard Hanagan, Columbus, Ill.

1—The first indication that the generator does not charge enough is reflected in the starter operation. A slight decrease in the capacity of the battery is immediately shown by the action of the starter.

2—Three.

3—See Fig. 8.

4—It is not necessary to throw on the starter switch. The automatic control takes care of this. We believe that this is the reason for the generator not working.

Chandler Spot Light Burns Out

Q—My 1918 Chandler equipped with a Westinghouse starting and lighting system and a 6-8-volt Willard battery has four dimmer lights, two being extra lights which I put on myself. I use Mazda D 6-8 volts 1-5 amp. 12 c.p. G 8 bulbs which keep burning out about a week after they

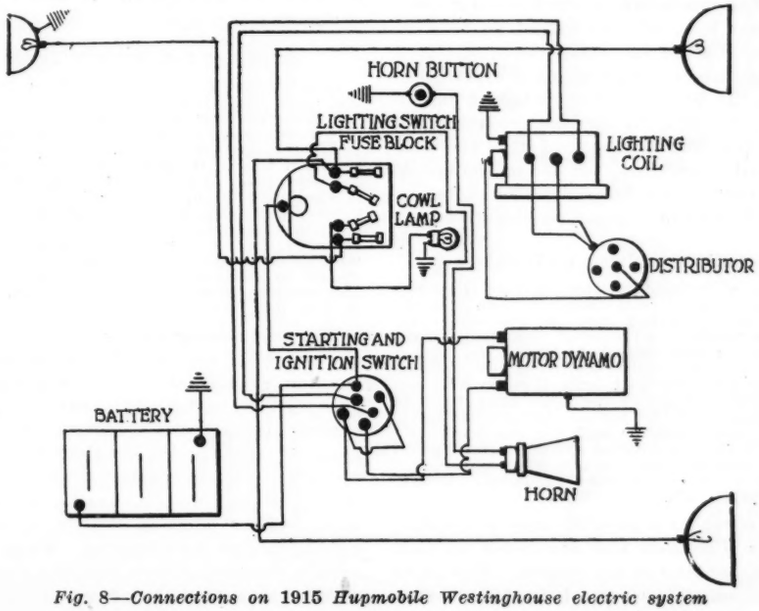


Fig. 8—Connections on 1915 Hupmobile Westinghouse electric system

are installed. I examined the wires on my windshield lights and found no trouble but instead of running a wire on the horn which I had at first I connected to the main battery lead and still get this trouble. I have examined the wiring and find same O. K. Would too strong a generator output burn out these lights?

2—Publish diagram of how to connect these two windshield lights. The wire now runs from one light on the left to the one on the right and then I cut in in the center and hook on the wire in the junction box running from the battery. The lights do not all burn out at one time, just one at a time.—E. Temple, Chicago.

1—There are two possible reasons for the lights burning out. One is that the lamps may be attached rather loosely, and this allows them to rattle, the vibration breaking the filaments of the bulbs. The other reason is that the voltage of the generator may be rather high, which means that the regulator is not functioning properly. This possibility is rather remote, for the high voltage conditions would be reflected in the other lights as well. This leaves the vibration theory as the only possibility, and we believe that fastening the lights on the windshield allows them to shake more than they ought to. This is the reason for spot light bulbs burning out so frequently.

2—The correct connection is as you say you have it.

Splitdorf Apelco Generator

Q—Can an Apelco starter and generator single unit system be used for a lighting system only?
2—Show wiring diagram and changes.
3—Show internal wiring when used as motor and generator.—A Reader, Canton, Kan.

1—Yes, this generator will work for lighting only.

2—This was explained in MOTOR AGE March 27, 1919.

3—See 2.

Recharger Design

Q—Publish diagram and how to make a magnet recharger to be used with A. C. City current. —Clayton Hinkel, Unionville, Mo.

Before the alternating current can be used for magnet chargers it must be rectified. We have published from time to time methods for constructing rectifiers. For the charger, two coils with soft iron cores will do. These coils should be wound with wire of sufficient size to carry about 10 or 12 amp.; the voltage need not be considered because the coil will be in series with some resistance unit necessary to provide the load. Use wire about 14 to 16 gage B. S. gage. The spools can be centered on a lathe and about 1 lb. of wire wound on each of the two. Before fastening the spools to a base, be sure that the spools are reversed. That is, the direction of the winding on one will be opposite to the direction on the other. It is not necessary to wind the wire in opposite directions, for one of the spools can be turned end for end. The sketch in Fig. 9 shows the charger construction.

Coil Wire Burns on Dodge

Q—On a Dodge 17, Delco ignition there are two wires leading from switch to coil. On the switch one is marked ignition, the other coil. The one marked coil smoked and would have burned up if they were kept turned on. Put a new wire, same results, switch is not shorted. Car runs all right with only the one wire but battery indicator shows discharge when it should show charge, and vice versa. New switch, lights all O. K. car runs fine with the one wire. My opinion is that distributor and coil are supposed to be insulated from the rest of car, and that distributor has become grounded.—Donald Bowie, Aspen, Md.

This is rather a peculiar case of trouble, and our diagnosis has convinced us that there is a ground in the system. Now as to the location of the ground, we believe that

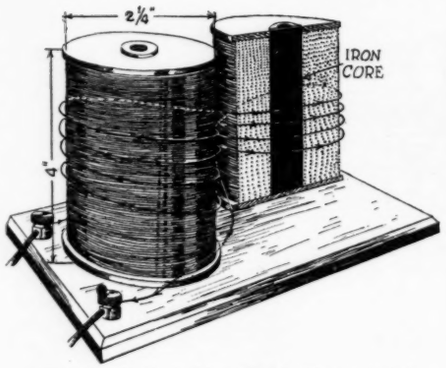


Fig. 9—Design of magnet charger for reader

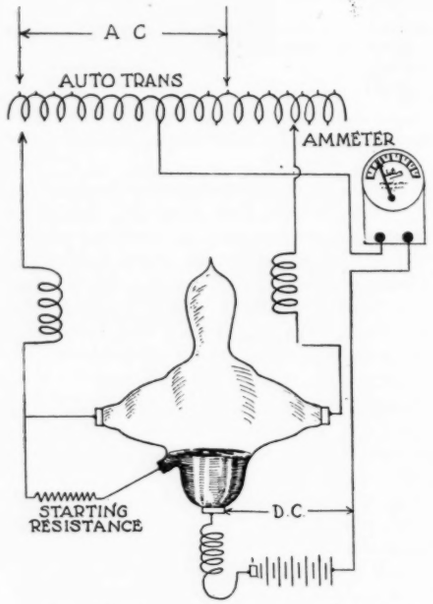


Fig. 10—Connecting an ammeter on a Westinghouse rectifier

you will find on the coil or near the coil some thing that is causing the trouble. It will take about 20 amperes to burn out the coil wire and for this reason we believe that when the switch is turned on the current coming direct from the battery passes through this wire to the ground and there leaves and goes back to the battery. This is almost a direct short.

Generator and Battery Voltage

Q—Concerning the operation of a Delco system on a Buick light six model D44. Suppose engine is running, generator delivering, lamps on. Now remove the socket of one headlight and test the voltage at the wires and we got a good strong 6 volts. By speeding up the engine we got close to 7 volts. By idling the engine until it showed a slight discharge the voltage will drop to about 5½ volts and the lights will dim a trifle. The system is giving good service but I would like to have a reliable answer as to whether this drop of voltage at slow speed should be present. Generator is in good shape, also all connections in charging circuit.—Carson M. Dee, San Luis Obispo, Cal.

There is nothing wrong with your car, or the electrical system. When the engine is running at a brisk rate, the generator is charging the battery. In order for the generator to charge the battery its voltage must be slightly higher than that of the battery. The generator must have sufficient voltage to overcome the battery voltage and in addition supply enough for the lights and the charging. When the engine is running so slow that the cutout has relieved the generator from charging, the voltage for operation comes from the battery. When there is a heavy demand on the battery its voltage drops slightly as can be proved by starting the car when the lights are turned on. The lights grow dim during the time that the starter is operating. This reduction in voltage will be at times lower than 5½ volts, so there is no cause for suspecting anything wrong.

Running Without Battery

Q—Would it not be entirely feasible to use the generator on 1916 Dodge for lighting when storage battery is removed, by either short circuiting generator leads where they join battery or by use of 9 or 10 dry cells in place of storage battery, the polarity of circuit through dry cells same as battery circuit?
2—Would dry cells be likely to be injured much by the high charge rate of the generator?
3—What would be the relative internal resistance of the dry and the storage battery as given above?
4—With the circuit breaker and field regulator in good order I can see no good reason to prohibit this short circuiting.—W. D. Link, Omak, Wash.

1—It is best to short circuit the generator leads.

2—Dry batteries will not work as their internal resistance is too high.

3—A dry battery when new has an internal resistance of about .072 ohms, while a storage battery of 120 ampere hr. capacity has only about .002 ohms.

4—Neither can we.

Magneto Coil Burns Out

Q—In the last six months the secondary coil on my Overland model 83 equipped with a Dixie magneto has burnt out three times. The machine is never run over 25 m.p.h. What causes this?—George W. Turner, Erie, Ill.

We believe that the safety gap of the coil has been tampered with, and when a spark plug wire is removed the full pressure is exerted on the coils, with the result that they burn out. Set the points of the gap so that they are ¼ to ⅜ in. apart.

Hupmobile Wiring Diagram

Q—Publish wiring diagram of model K Hupmobile.—M. M. Eley, Union Springs, Ala.

This was shown in the MOTOR AGE wiring diagrams of Feb. 13 issue, and is shown here in Fig. 8.

Ammeter on Rectifier

Q—Can I connect an ammeter to a type W. I. Westinghouse rectifier? I have one of these instruments for charging a 6-cell Willard 51-amp. 12-volt battery.
2—What is the proper voltage and amperage of a dry cell battery when fully charged? Recently I bought six dry cells. These cells were worthless, completely exhausted. Out of the six cells connected in series I obtained a faint spark. The dealer I bought these cells of refused to take them back, claiming they were fully charged.—George Kraus, Mogollon, N. M.

1—The ammeter connection on this set should offer no difficulty. The diagram is shown in Fig. 10.

2—A good dry cell should have a voltage of about 1.6 to 1.8, and the amperage should be about 25. It is never good policy to measure this with an ammeter, because the act of measuring imposes a very heavy drain on the cell and ruins it if continued only for a few seconds. It is better to assume the amperage is up to standard if the voltage measures above 1.6.

Controller on Old Mitchell

Q—Illustrate the internal connections of the controller that is used on my 1912 or 1913 Mitchell.—O. Landstet, Dell Rapids, S. D.

The diagram for this system is shown in

Fig. 12. This is a back view of the controller and the connections to the units are shown in minature.

Carburetion

Adjusting Schebler Carbureter

Q—I have replaced the old carbureter on my 1917 Maxwell 25 with a Schebler model L which seems to be in good condition but which I have not been able to adjust properly. If I set the needle valve thumb screw so as to give the proper amount of gas to give it power it will misfire and foul the plugs. It seems as if I can not get the proper mixture of air according. If I cut the gas down by the needle valve and release the tension on the air valve it will run all right but does not have the power and heats up caused by the mixture being too lean. Give instructions to adjust.

2—Do you think this is a very good change?—Clyde Graves, Ft. Worth, Tex.

1—In adjusting the carbureter, see Fig. 11, first make your adjustment on the auxiliary air valve "A" so that it seats firmly; then close your needle valve by turning the adjustment screw "B" to the right until it stops. Do not use any pressure on this adjustment screw after it meets with resistance. Then turn it to the left from four to five complete turns and prime or flush the carbureter by pulling up the priming lever "C" and holding it up for about five seconds. Next, open your throttle about one-third and start the engine, then close your throttle slightly and retard your spark and adjust throttle lever screw "F" and needle valve adjusting screw "B," so that the engine runs at the desired speed and hits on all cylinders.

After getting a good adjustment with your engine running idle, do not touch your needle valve adjustment again, but make your intermediate and high-speed adjustments on the dials "D" and "E." Adjust pointer on the first dial "D," from figure No. 1 towards figure No. 3, about half way between. Advance your spark and open throttle so that the roller on the track running below the dials is in line with the first dial. If the engine backfires with the throttle in this position and the spark advanced, turn the indicator a little more toward figure No. 3, or, if the mixture is too rich, turn the indicator back or toward figure No. 1 until you are satisfied that your engine is running properly with the throttle in this position, or at intermediate speed. Now open the throttle wide and make your adjustment on your dial "E" for high speed in the same manner as you have made your adjustments for intermediate speed on dial "D." When first starting engine, it will be inclined to backfire, caused by all the parts being cold. However, do not readjust carbureter, but wait until the engine is warmed up.

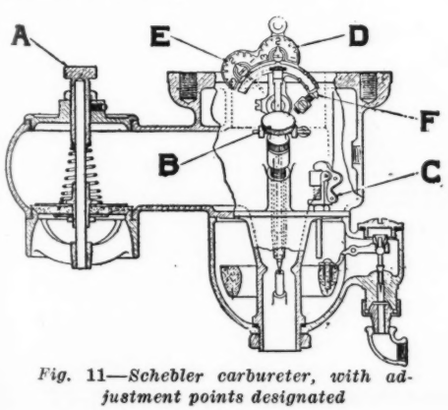


Fig. 11—Schebler carbureter, with adjustment points designated

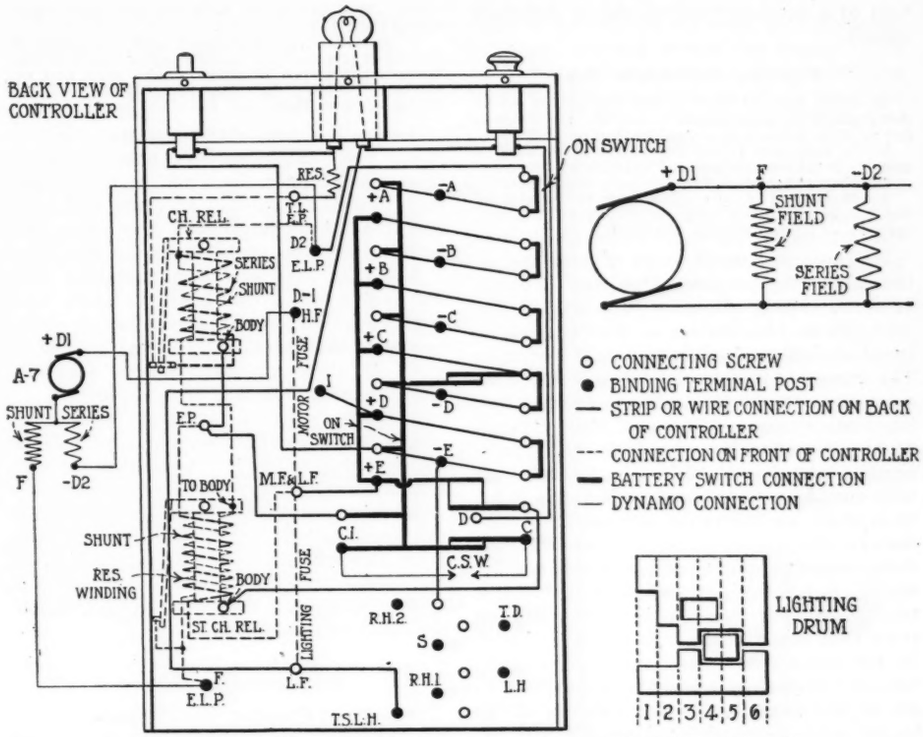


Fig. 12—Rear view of Splitdorf Apelco controller used on 1913 Mitchell

We find in the majority of cases in adjusting the carbureter the tendency is to give too rich a mixture. We recommend in adjusting the carburetor at low, intermediate and high speeds that you cut down the gasoline until the engine begins to backfire, and then increase the supply of fuel, a notch at a time for low speed, until the engine hits evenly on all cylinders. Do not increase the supply of gasoline by turning the needle valve adjusting screw more than a notch at a time, in your low-speed adjustment, and do not turn it any after your engine hits regularly on all cylinders. In making the adjustments on the intermediate and high-speed dials, do not turn the pointers more than one-half way at a time between the graduated divisions or marks shown on the dials.

2—This carbureter should work very well on your engine.

Definition of Wire Drawing

Q—Define what the term "wire drawing" means as applied to carbureter or manifold action.—P. E. W., Temple, Tex.

Wire drawing is the effect produced by having a restricted passage at any portion of the manifold. The term "wire drawing" is aplicable here because in the process of manufacturing steel wire the red hot metal is forced through restricted passages in the dies.

Flanders Motorcycle Backfires

Q—The gas blows back through the air intake of the carbureter on my Flanders motorcyle. The intake valve is of the suction type and said to be O. K. by an expert motorcycle man. The compression is good and the timing is right, but the leak still continues, more at higher speeds than at lower. Both valves were reground and new gaskets fitted under the intake. Have also tried another carbureter.

2—Where can I get repairs for this machine?—C. G. McClellan, Nakin, Ohio.

1—If you examine the intake manifold very closely you will discover, we are sure, small air leaks that allow the mixture to become so thin that backfiring is made possible. These leaks may be at the junction point between the engine and the manifold or the carbureter and the manifold. In any event, the trouble is most probably at one of the two places, maybe both.

2—Repair parts for the Flanders motorcycle may be obtained from the Universal Motorcycle Co., 2306 W. Chicago Ave., Chicago, and the American Motorcycle Supply Co., 2047 W. Chicago Ave., Chicago.

Manifold Vacuum

Q—If an engine is running normally, idle, for instance, won't the suction in manifold, or reduction below atmospheric pressure be constant or approximately so, at any degree of throttle valve opening? That is, in the manifold between throttle valve and cylinder block. It seems to me it couldn't be otherwise.—Reader, Atlanta, Ga.

1—We take it that you mean the manifold vacuum is constant at any engine speed is constant, providing that the engine is idling. This is not so. The curve in Fig. 13. shows the vacuum of the mani-

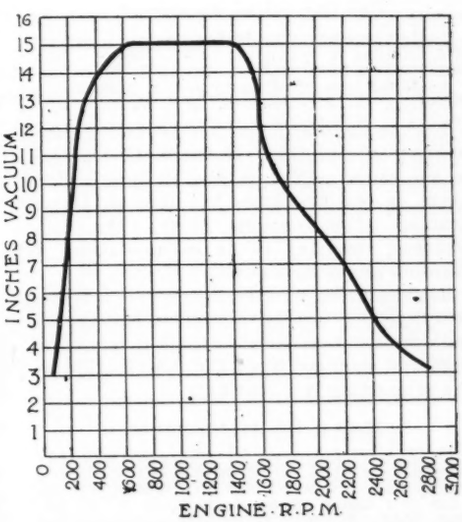


Fig. 13—Manifold vacuum at various engine speeds

fold of a multi-cylindered car at different speeds.

Figuring Carbureter Jet

Q—How can the correct size carbureter jet be determined for any engine? Are the revolutions per minute taken into consideration on this?
2—In reboring cylinders, would it be well to enlarge intake manifold and valve ports?
3—How can piston displacement be figured?
4—In designing an engine, how is the size of the intake manifold and valve openings determined?—Clayton Hinkle, Unionville, Mo.

2—There are many ways of arriving at the carbureter jet size. One way is to assume an engine efficiency of about 20 per cent, when the engine is traveling at a speed equivalent to 1000 piston ft. per min. The power of the engine at this speed is very close to the S. A. E. rating, and for illustration we will assume that this is 25 hp. Gasoline has about 20,000 B. t. u. per lb., 1 hp. has 42.42 B. t. u. per min., so with our 25 hp. the necessary B. t. u. will be 25×42.42, or 1060 with 100 per cent efficiency. Our engine is 20 per cent efficient, so the required amount of heat is $1060 + .20$ or 5300 B. t. u. per min., which is equivalent to .265 gal. per min. It is general to assume fuel flow velocities as about 60 to 70 ft. per min., so we will assume 65 ft. per min. as the fuel velocity at the jet. 0.265 gal. is 61.2 cu. in., so with a velocity of 65 ft. per min. the fuel jet diameter will be 0.127 in. This is a rough approximation and it does not take into consideration many of the constants that effect liquid flow through an orifice. The problem is a very theoretical one and we recommend that you study some book on carburetion, such as the Handbook of Carburetion, by Arthur B. Brown, published by John Wiley & Sons, New York.

2—It is considered necessary to enlarge large the manifold, but the valve ports can be enlarged, giving a decided difference in the engine operation.

3—Piston displacement is figured from the following formula:

$D^2 \times .7854 \times$ number of cylinders $\times$ stroke, all in inches.

4—The maximum diameter of the manifold can be assumed as the bore divided by two. There should be as few turns as possible and no restricted areas at any section.

Lubrication

Cadillac Oiling Explained

2—Is there any remedy for the oiling system of a Cadillac in which the right block of cylinders receives more oil than the left?
3—What type of oiling system is used in the Packard?—R. R. Crawford, New Haven, Conn.

2—The Cadillac oiling system is designed to take care of this. If too much oil goes to one set of cylinders, the oil level is too high, or the crankcase oil has not been drained often enough during the cold weather, resulting in an accumulation of gasoline in the engine oil.

3—The Packard uses a pressure lubrication system, having a hollow crankshaft with pressure oil leads to all mean bearings and annular rings for distribution to the connecting rod bearings.

Heavy Oil in Chevrolet

Q—The oil pump on my Chevrolet 490-1917 showed very little action on dial after running awhile and I was advised to use heavier oil. I am now using "Gargoyle Mobiloil A" at medium body. It seems to register action on dial now. Is this too heavy for my car?
2—I tightened connecting rod bearings, removing the thin shim which seemed to be sufficient. Will the oil be too heavy now since tightening them?
3—In removing crankcase I found considerable sediment of a metallic nature, apparently ground from bearing, yet bearings looked good and not burned. Where did this come from?—Walter Hahn, Caney, Kan.

1—In the summer time, no. Winter time, yes. Examine the pump and see that the plunger does not fit too loosely and that the oil leads are free and clear and that there is no leak any place that would spoil the registration on the gage.

2—Great care must be exercised with an engine when the bearings have been tightened. Do not drive over twenty miles per hour until that stiffness has been worn out. If these precautions are observed, then the heavy oil will do no harm.

3—Most of this material came from road dust. It has been said by a very prominent engineer that if air cleaners were fitted to motor cars they could be run 50,000 miles with no appreciable wear showing on the bearings. Some of this material came from the sand left on the castings while they were yet new. The rest of the material is metal from the bearings, shafts, pistons and cylinder walls.

Miscellaneous

Thief-Proofing an Overland

Q—Is there a way to lock a model 83 Overland to make it thief-proof and still be in accordance with the city ordinance?—C. G. McClellan, Nakin, Ohio.

If a car is locked in accordance with city requirements, it can be towed away, no matter how efficient the lock may be. Ignition locks can be jumped, and there are cases on record where whole new ignition systems have been installed to get around the lock. Transmission locks are effective, but the car can still be moved if it is towed. Steering gear locks are considered very good. It is a question of choice, whether one wants to use a steering gear lock, a transmission lock, an ignition lock, or some other kind. Why not try all of them at the same time if you want to take every precaution that is within the bounds of city ordinances?

Adjusting Lexington Pinion

Q—A Lexington 6-0-17 is giving me considerable trouble. I am not able to keep the gears in. How can I adjust the pinion to remedy this?
2—Is the clutch a dry-disk, or is it supposed to run in oil?—J. H. Rappold, Newport News, Va.

1—The adjusting screw on the Lexington can be seen in Fig. 20. This adjusts the pinion gear only. The ring gear is adjusted by turning the collars, which can be seen on each side of the ring gear when the rear part of the differential housing is removed. These collars are of the give-and-take type. The one on the back face should be loosened

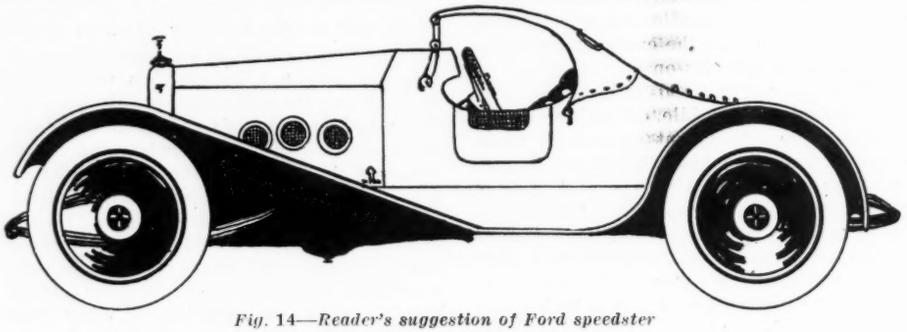


Fig. 14—Reader's suggestion of Ford speedster

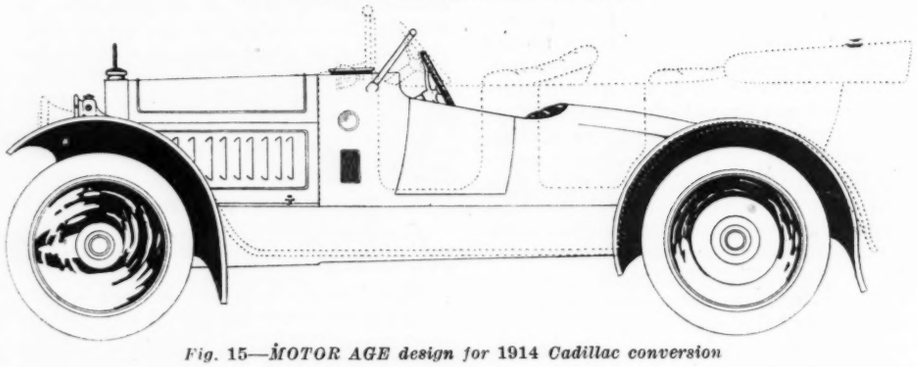


Fig. 15—MOTOR AGE design for 1914 Cadillac conversion

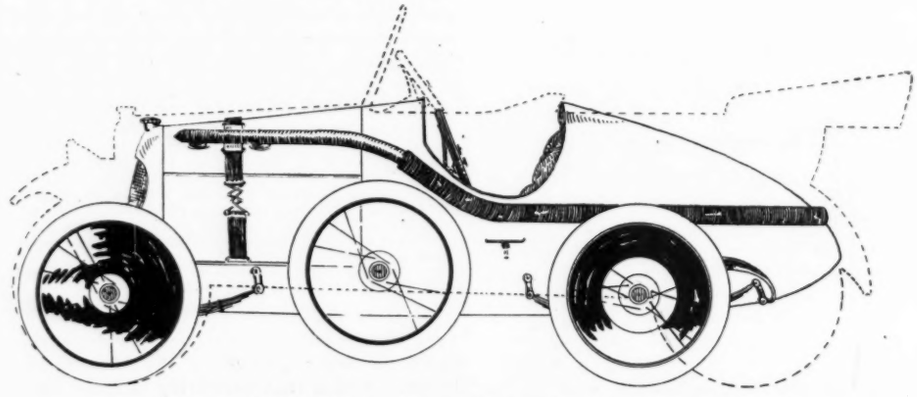


Fig. 16—A 1917 Lexington redesigned into a snappy racing car

first and the other moved up to it, if the gear is moved away from the pinion, and the reverse order followed, if the movement is to be the other way. Make the clearance of the gear teeth so that when the car is jacked up, a cigaret paper can be put through the gear teeth when the wheels are turned and the paper not injured.

2—The clutch is of the dry-disk type, made by Borg & Beck, Moline, Ill. Do not run the clutch in oil, as it is designed to be run as a dry-disk clutch, notwithstanding the fact that many experimenters say a dry-disk clutch works better in oil.

Ring Gear May Be Warped

Q—The rear axle of my Studebaker six became very noisy and upon taking same apart find the bearings and cones in fine shape, but the master gear shows four bright or worn cogs in three different places on the gear. These places are one-third distance on ring gear from one another. This is a 13 by 52 gear or 4 to 1. Why are those places equal distance apart and what caused it?—William Jennings, Altamont, Kan.

1—We believe that this is a defective gear, and that during the quenching and hardening process the prongs of the die that holds the gear while it is being quenched allowed the gear to warp. This is the reason for the three bright spots on the teeth at equal intervals.

Rebuilding

Hints for Rebuilders

Many dealers at some time or other have a customer bring in a car to be rebuilt, especially along racing lines. This year will probably see considerable more interest along these lines, for with the anticipated car shortage there will be those who want to doll up the old boat with a special body and perhaps doctor the engine to do a few more miles per hour. Such rebuilding requires data and formulas which are often unavailable, but a few general hints can be given here that will help.

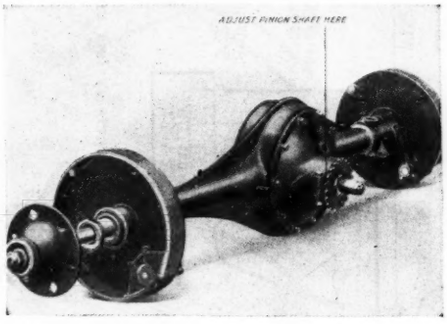


Fig. 20—Rear axle on Lexington, showing adjustment pinion

Take valves, for instance. Setting them ahead is all right if you are going to run the engine at high speeds constantly. At slow speeds, however, the explosions are too early and a tremendous strain is thrown on the pistons, connecting rods, etc. Tapering the cams to produce a quicker lift is a delicate job which should be done only by an expert along these lines. Pistons and rods in cars of fairly recent date are designed by the factory to be as light as possible and still have the necessary strength. When they are perforated with holes with the idea of adding to the speed of the engine, each hole makes the piston just that much weaker. It is, of course, true that pistons can be lightened quite a bit by drilling, but in the end, what have you got? A far better plan would be to fit some of the lightweight pistons, either aluminum or gray iron.

On the speedsters extra lubrication is often advisable where the owner expects to maintain high speeds for any length of time. This can consist of nothing more than an auxiliary oil tank placed somewhere on the frame or in the cowl and forcing the oil to the crankcase by a hand pump. This is desirable particularly on Ford cars, where the splash oiling system is used.

On speedsters a lower rake to the steering column is desirable and the particular way of mounting the steering gear in the frame will determine how the change can be made. Usually it is possible to place wedge-shaped pieces of wood or steel on the frame and bracket and drilling new holes for the holding down bolts. On some steering gears it is only necessary to loosen the bracket clamp and swing the column down to the desired angle and replace the clamp bolt.

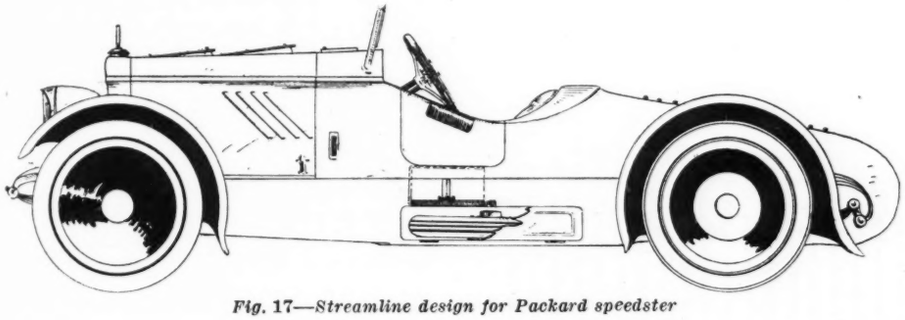


Fig. 17—Streamline design for Packard speedster

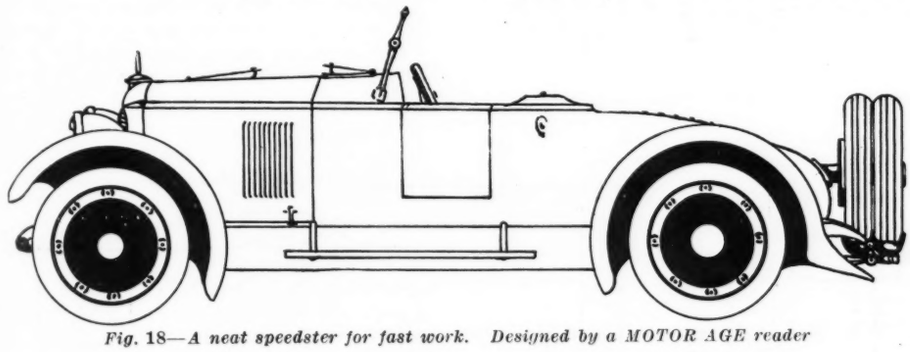


Fig. 18—A neat speedster for fast work. Designed by a MOTOR AGE reader

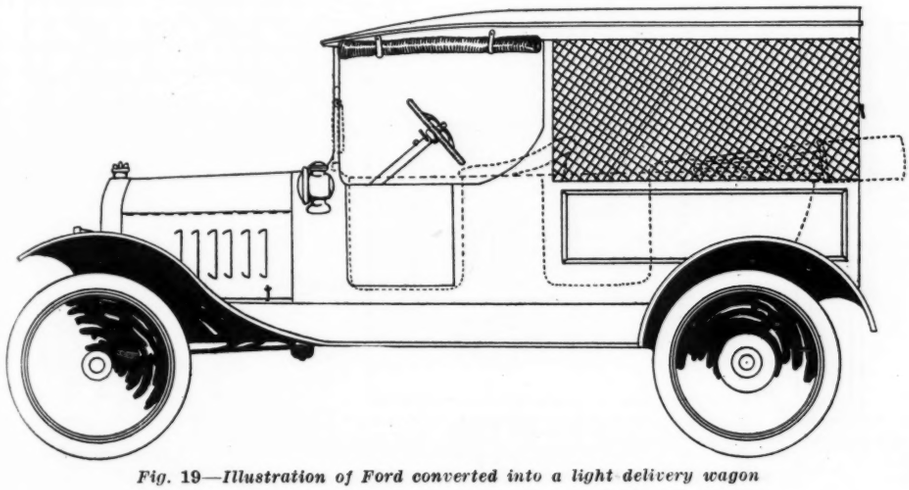


Fig. 19—Illustration of Ford converted into a light delivery wagon

Cadillac Speedster

Q—Publish complete information how to convert a 1914 5-passenger Cadillac into a classy speedster.—E. N. Quinn, Madison, Wis.

The speedster suggestion is shown in Fig. 15. The length of detailed description that involves this change is dependent upon the facilities at your disposal. The average car owner does not have the tools and machinery to make a body so we advise that the body be built by some body manufacturer. For the addresses see the advertising section of MOTOR AGE. Details such as lowering the steering wheel, fitting an under pan, and applying a different windshield are best left to the owner's ingenuity.

Lexington Speedster Suggestion

Q—Publish illustration of stream line racer body for a Lexington 6-0-17 whose wheelbase has been shortened to 96 in. and has been specially built for racing and equipped with Houk wheel and carrying two spare wheels, one on each side of chassis.—A Reader, Greensboro, N. C.

Our suggestion is shown in Fig. 16.

Ford Delivery Wagon Design

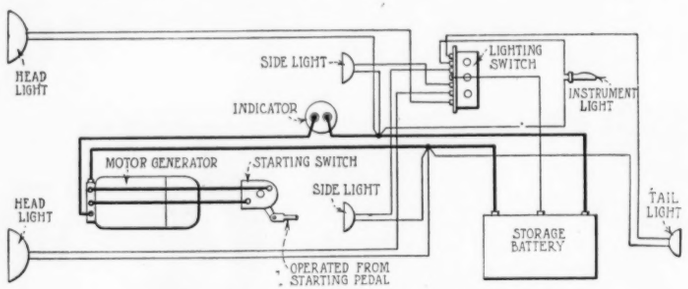
Q—Give suggestions for converting Ford into a No. 1 carrier outfit.—Chester Hollenbeck, Keithsburg, Ill.

We have assumed that you wish us to design a light delivery outfit, and show the car in Fig. 19.

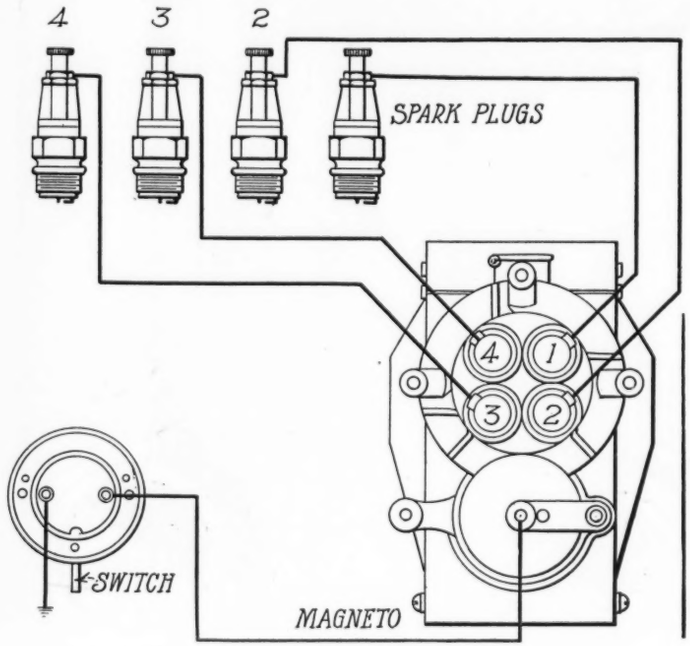
Motor Age Wiring Diagram Chart No. 28

This Week—Special Systems for Fords

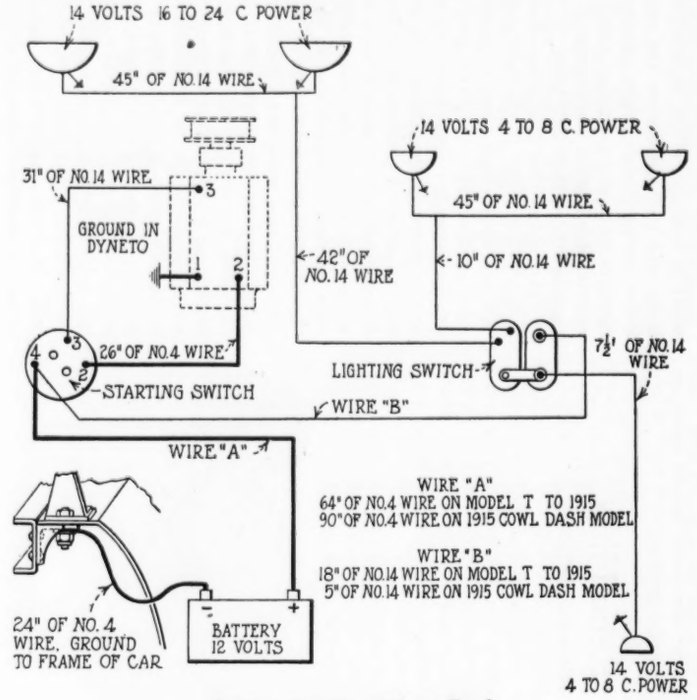
Abbott—March 20-27
Alco—April 24
Alter—Nov. 14
Apperson—March 6
Buick—Nov. 21-April 3
Cadillac—Dec. 9
Cartercar—May 1
Cole—Jan. 23-April 3
Case—Feb. 27
Chalmers—Feb. 20
Chandler—April 3
Chevrolet—Nov. 28-March 27
Davis—May 8
Detroiter—March 6
Dodge—Dec. 12
Dort—March 13
Elgin—Feb. 27
Empire—March 13
Ford—Jan. 30
Grant—Feb. 27-March 27
Henderson—April 3
Hudson—Dec. 5-May 1
Hupmobile—Feb. 13
Interstate—March 13
Krit—Feb. 6
Lexington—April 24
Little—March 20
Locomobile—Jan. 23-April 17
Marion—March 6-20
Maxwell—Jan. 16
Mercer—Jan. 23
Michigan—March 20
Mitchell—Jan. 9
Murray—May 1
Oakland—Jan. 2
Oldsmobile—Jan. 23
Overland—Nov. 7-14
Premier—April 10
Pullman—April 10
Regal—Feb. 6-April 10
Reo—Feb. 27
Saxon—April 17
Simplex—April 17
Scripps-Booth—Dec. 26
Stearns-Knight—April 24
Studebaker—Dec. 26
Velie—April 24
Westcott—May 8



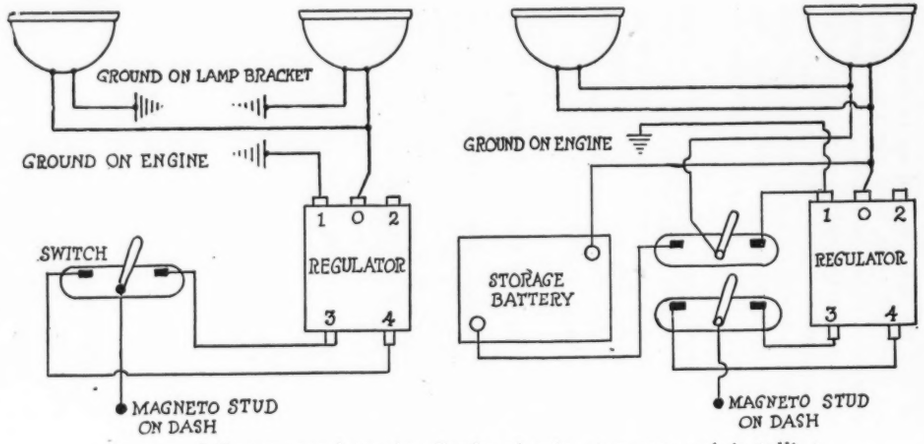
North-East system on Fords, 1913-1914



Connections for Dixie magneto on Fords


14 VOLTS 16 TO 24 C. POWER
45" OF NO.14 WIRE
14 VOLTS 4 TO 8 C. POWER
45" OF NO.14 WIRE
31" OF NO.14 WIRE
GROUND IN DYNETO
42" OF NO.14 WIRE
10" OF NO.14 WIRE
26" OF NO.4 WIRE
7½' OF NO.14 WIRE
STARTING SWITCH
LIGHTING SWITCH
WIRE "B"
WIRE "A"
WIRE "A"
64" OF NO.4 WIRE ON MODEL T TO 1915
90" OF NO.4 WIRE ON 1915 COWL DASH MODEL
WIRE "B"
18" OF NO.14 WIRE ON MODEL T TO 1915
5" OF NO.14 WIRE ON 1915 COWL DASH MODEL
24" OF NO.4 WIRE, GROUND TO FRAME OF CAR
BATTERY 12 VOLTS
14 VOLTS 4 TO 8 C. POWER

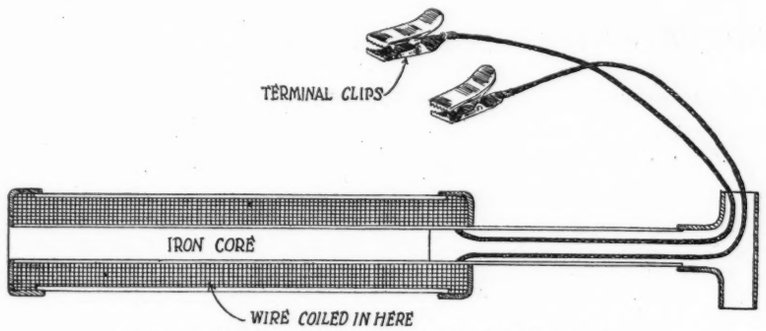
Dyneto system used on Fords



Jefferson regulator for Fords, showing two ways of installing

The Motor Car Repair Shop

Practical Maintenance Hints



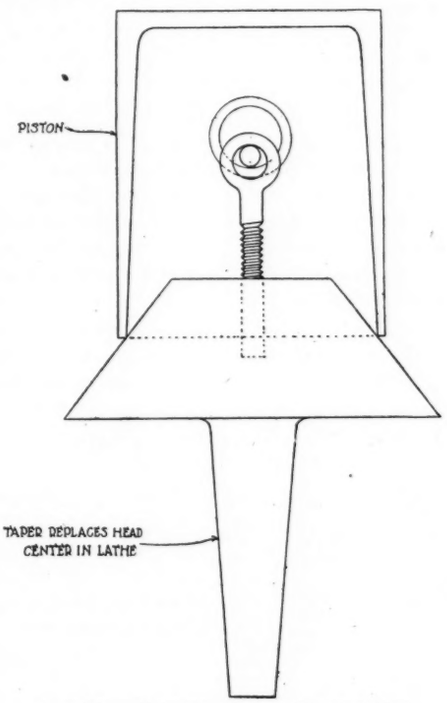
Sectional view of pickup magnet for inaccessible places

Pickup Magnet

A PICKUP magnet which can be used for picking up iron and steel parts dropped in inaccessible places about the car can be made from pipe fittings and magnet wire. The materials consist of a piece of ⅜-in. pipe, 14 in. long, threaded at both ends; a piece of 1¼-in. pipe, 7 in. long, threaded at both ends, and two caps for same; a ⅜-in. tee and an iron core to fit snugly inside the ⅜-in. pipe; 120 ft. No. 18 magnet wire; 8 ft. flexible wire and two snap connectors. The magnet wire is wound around the ⅜-in. pipe and the tool assembled as shown with the flexible wire coming out through the tee which forms a handle. The winding is designed for a 6-volt current, although 12-volt may be used for a very short time without injury to the windings.—Connel & McCone, Overland, Boston, Mass.

Spring Compressor

Quick replacement of valve springs on a multi-cylindered engine easily is effected by using two clamps which hold the valve spring in compression until it is in place on the engine. Then the clamps can be pulled off to allow the spring to resume its normal form. The usual method is to compress the spring in a vise and then attach the clamps, but where any amount of this work is done a special machine is advisable. The valve spring and its seat, which rides on the valve stem retaining pin, is put in the apparatus, the spring compressed by pressure of the foot in the stirrup and then the clamps are attached. There is an adjustment at the top to accommodate different lengths of springs, and the mechanism is returned to normal position by the two springs shown as part of the apparatus.—Packard Motor Car Co., Boston, Mass.



A quick acting jig for chucking pistons

Radiator Soldering

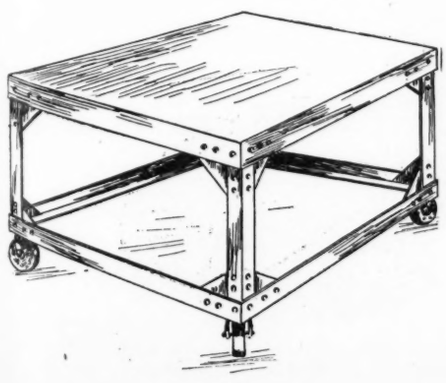
To facilitate handling a radiator which must be inspected and then repaired, a rope or cable which readily may be fastened to the filler spout or other convenient part, and which runs over two pulleys to an anchorage on the edge of the bench, will be found of great convenience. The rope support carries at least half the weight of the radiator, making it easier to handle. Furthermore, by adjusting the position of the rope the radiator may be held in almost any position found most desirable for either inspection or repair work. The rope instantly may be adjusted to any position since it is caught in a sharp V block on the edge of the bench.

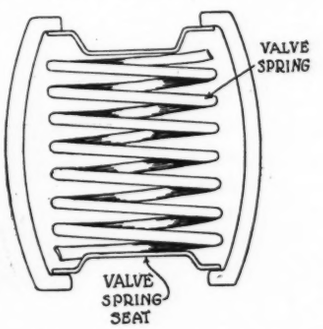
Engine Stand

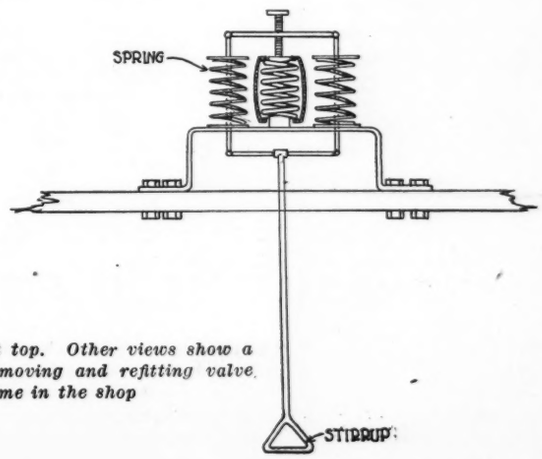
An all-steel engine stand with a flat top offers the advantage that the engine or other unit may be rested on it in any convenient position. It is provided with casters so that it may be pushed close to the car. A tray for holding parts can be mounted underneath, if desired.—Connel & McCone, Overland, Boston, Mass.

Piston Jig

A quick-acting jig for chucking pistons which must have lathe work done upon them is illustrated. It consists of a broad cone which takes the place of the regular lathe head center and a screw eye which is threaded into its center, holding the skirt edge of the piston fast and true against the cone by the cross piece which goes through its eye and through the wristpin holes in the piston. The conical base obviously allows pistons of any size to be chucked.



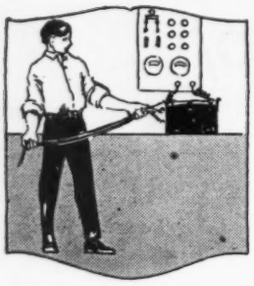




Left, all-steel engine stand with flat top. Other views show a spring compressor to be used in removing and refitting valve springs, it saves much time in the shop

Jefferson regulator for Fords, showing two ways of installing

Connections for Dixie magneto on Fords



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the **146th** *installment of a weekly series of articles begun in* MOTOR AGE, issue of *June 29, 1916, designed to give the repairman and motorist the knowledge which will enable them to care for and repair any and all of the electrical features of the car, no matter what make or model it may be.*

The first half of this series has been published in book form by the U. P. C. Book Co., Inc., 243-249 West Thirty-ninth street, New York, and is sold at $2.50. The remainder of the series will be published as a supplementary volume.

Part CXLVI—Westinghouse Electrical Systems

The generator with the combined cutout and regulator mounted on it and no ignition head has two terminals marked —B and L or —B and +B, and another machine of exactly the same type but used with an electromagnetic starting motor gearshift has three terminals marked —B, S and L. The generators with the combined cutout and regulator mounted on them and, in addition, an ignition head may have two terminals marked —B and L or —B and +B, or they may have three terminals marked —B, S and L.

Third-Brush Regulation

The generators with third-brush regulation are of the shunt-wound type, and their output is regulated by the third-brush method. An electromagnetic cutout mounted outside the generator automatically connects and disconnects the generator and the battery. In some cases this cutout is combined with the starting switch, and in some cases it is mounted inside the generator frame.

A diagram of a typical system of this kind is shown in Fig. 711. Generators of this type are provided with two terminals marked A— and F, and the cutout has three terminals marked A—, B— and F. An inspection of the diagram will enable you readily to trace the following circuits. The shunt coil and the cutout is connected between the negative terminal of the generator marked A— and the ground which corresponds to the positive terminal of the generator. When the cutout contacts close a circuit is established from the grounded terminal of the generator to the grounded terminal of the battery through the battery, through the ammeter to the terminal B— on the cutout, through the cutout contacts and series coil of the cutout and to the terminal A— on the cutout to terminal A— on the generator, through the generator to the positive, or grounded, terminal which completes the circuit.

Some of the generators having third-brush regulation have the cutout mounted inside the frame of the machine, and in such cases the generator has only one terminal and this terminal connects to the negative battery terminal. The cutout is mounted inside the cover at the commutator end. The core of this cutout can be raised or lowered and the air gap between the lower end of the core and the movable armature changed. When the adjusting screw is turned to the right the air gap is decreased and the cutout closes at a lower dynamo speed or voltage, while turning the adjusting screw to the left increases the air gap and the cutout closes at a higher dynamo speed or voltage. The frames of these generators are made from steel pipe and are known as No. 760.

Some of the generators with third-brush regulation are provided with an ignition unit as shown in Fig. 712. Should it be necessary at any time to operate the car with the battery disconnected, the following instructions should be observed properly to protect the system. The 5-ampere fuse in the shunt-field circuit should be removed. This fuse may be mounted on the back of the cutout switch or perhaps inside the switch, in which case there

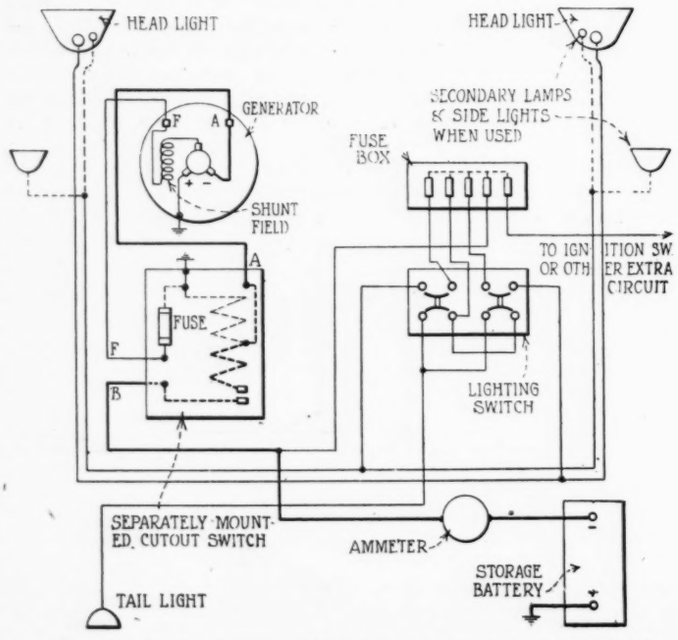


Fig. 711—Wiring diagram of Westinghouse gen erator with third-brush regulation and separately mounted cutout

Fig. 712—Westinghouse lighting generator with vertical ignition head, third-brush regulation

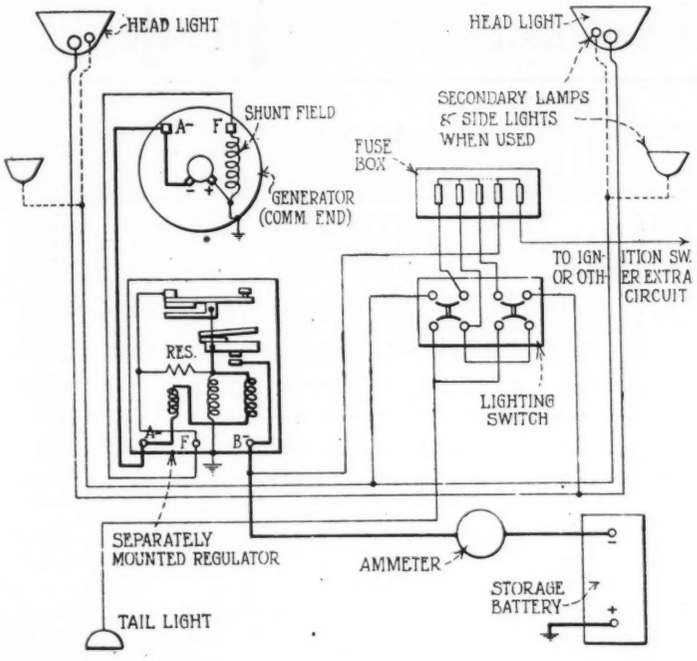


Fig. 713—Wiring diagram of combined cut-out and voltage regulator, separately mounted

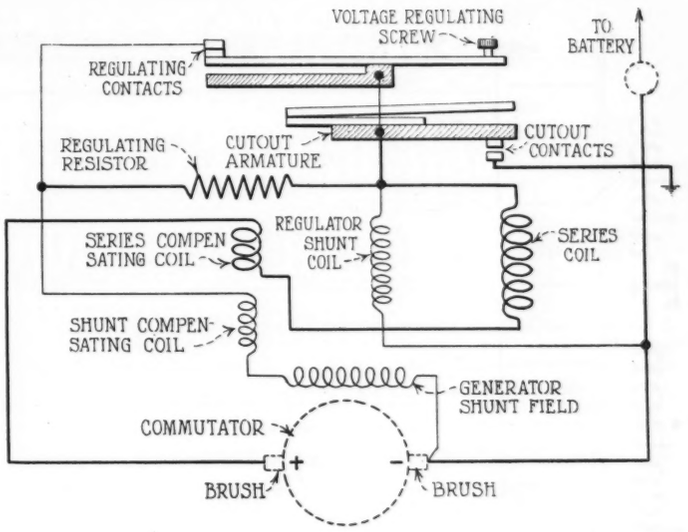


Fig. 283—Wiring diagram of Westinghouse combined cutout and regulator, mounted inside of generator

will be a note to that effect on the outside. If no fuse can be found and there is still a shunt-field circuit, any two of the generator brushes should be removed. In removing each brush it should be noticed which side was up, and each brush should be replaced in its original holder with the proper side up, taking care to see that the brush is resting against the commutator.

Electromagnetic Voltage Regulation

Generators with electromagnetic voltage regulation have their output regulated by intermittently varying the resistance of the shunt field circuit. A diagram of the internal connections of a generator of this kind, in which the regulator is mounted separately, is shown in Fig. 713, and one in which the regulator is mounted inside the generator housing is shown in Fig. 714. The principle of operation of the regulator is the same in both cases, and it is combined with the automatic cutout and all placed in one housing. Two views of the combined regulator and cutout are shown in Fig. 715. This combined unit performs the following functions That of a cutout, which automatically connects and disconnects the generator from the battery when the generator is driven above or below a predetermined speed and that of an automatic voltage regulator which, after the cutout has connected the generator circuit to the battery, automatically keeps the generator voltage at a predetermined value. Each function is performed by its individual element, but the operation of the second function depends upon that of the first.

When the generator is being operated at a speed below the predetermined cut-in speed, the contacts of the cutout armature are open, the voltage of the generator being below that of the battery. When the generator speed reaches the cut-in speed these contacts are closed, connecting the generator circuit to the battery circuit. The cut-in speed varies from 5 to 10 m.p.h. on high gear, depending upon the gear ratio and wheel diameter of the particular car.

The cut-in speed of the generator can be observed by running the car, allowing it to increase in speed slowly and observing on the speedometer the speed at which the car is running when the cutout contacts close, which is indicated by a slight movement of the meter needle.

The regulator is so constructed that the cutout operates to disconnect the generator from the battery circuit at a speed slightly below the cut-in speed. This enables the regulator to keep the circuit closed and not constantly open or close it when the car

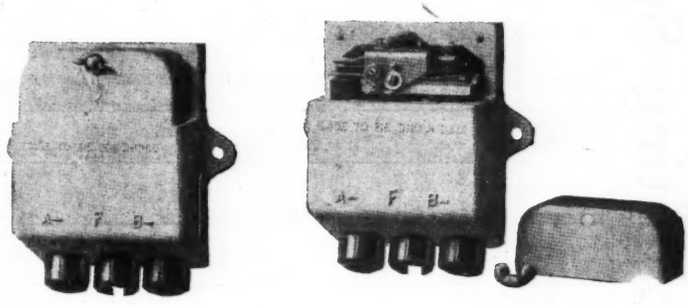


Fig. 715—Two views of Westinghouse combined cut-out and voltage regulator for separate mounting

is being run at speeds close to cut-in speed. This disconnecting of the generator from the battery circuit when the generator voltage is below the battery voltage insures that the battery will not be discharged through the generator.

The shunt fields of these generators are so designed that a voltage in excess of the normal voltage regularly would be generated when the generator is operated at high speed and no load. This excess voltage is prevented, and the voltage is held constant by the automatic voltage regulator. When the generator is operating below cut-in speed the contacts of this regulator are closed and remain closed until the generator armature is revolved at a speed which generates a voltage in excess of a predetermined value. This voltage is fixed by the setting of the voltage-regulating screw, which is adjusted at the factory and should be changed only by an experienced man. When, due to the increased speed of the generator, the voltage tends to exceed the value for which the regulator is set, the regulating contacts open, opening the direct shunt-field circuit and cutting in the regulating resistance. This causes a momentary drop in voltage so that the contacts close again. This opening and closing of the contacts is continuous and so rapid as to be imperceptible to the eye and to hold the voltage constant.

The generator used with a separately-mounted combined cutout and regulator has two terminals marked A— and F. The F terminal corresponds to the shunt field, and the A— terminal corresponds to the ungrounded, or negative, terminal of the generator. There are three terminals on the cutout marked A—, F and B—. The A— and F terminals connect to the corresponding terminals on the generator, and the B— terminal connects to the negative terminal of the battery. The generator with the combined cutout and regulator self-contained has only one terminal, and it is marked B—.

Motor Age Monthly Farm-Lighting Specification Tables

Name and Model	Maker	Watts capacity	No. 20 watt lamps	Lamp voltages	No. cyl'rs	No. cycles	Make of engine	Horsepower	Fuel	Cooling	Power pulley	Generator drive	Make of generator	Make of battery	Battery amp. hours	Battery, volt	No. cells	Starting engine	Stopping engine	Governor, type	Price
			15–25		2	2		3		Air	Opt.	Shaft			60	28–42				Throttle	
Aerothrust	Aerothrust Engine Co., La Porte, Ind	1000	75–120	40	1	4	Ide	11¼		Water		Direct					16				
Alamo	Alamo Farm Light Co., Omaha, Neb	750	40	110	1	4	Alco	2	G	Water	Opt.	Direct	GE Alco	Willard	76	6	3	Auto.	Auto.	Electro sole.	$ 375
Alco	Automatic Light Co., Minneapolis, Minn	850	55–75	32	1	4	Alco	2	G	Water	Opt.	Direct	GE Alco	Willard	80	32		S-Auto.	Auto.	Electro sole.	450
Cushman, A	Cushman Motor Works, Lincoln, Neb	1000	20–70	32	1	4	Own	4		Water	Yes	Belt	Imperial		80	32	16	S-Auto.	S auto.	Throttle	
B		1000	25–75	32	1	4	Own	4		Water	Yes	Belt	Imperial		120	32	16	S Auto.	S auto.	Throttle	
E		1000	50–100	32	1	4	Own	4		Water	Yes	Belt	Imperial		180	32	16	S Auto.	S auto.	Throttle	
Delco, ¾ KW, 32 volt	Domestic Engineering Co., Dayton, Ohio	750	20–72	32	1	4	Own	1½	K	Air	No	Direct	Own	Exide	80–160	32	16	S-Auto.	Auto.	Voltage	425–490
3 KW, 32-volt		3000	150	32	1	4	Own	5	K	Air	No	Direct	Own	Exide	80–160	32	16	S-Auto.	Auto.	Voltage	900
3 KW, 110-volt		3000	150	110	1	4	Own	5	K	Air	No	Direct	Own	Exide	80–160	112	36	S-Auto.	Auto.	Voltage	1,200
Dyneto, 5	Dyneto Electric Co., Syracuse, N. Y	600	20–42	32	1	4	Novo	1½		Water	Opt.	Belt	Own	Willard	53	32	16	S-Auto.	S-Auto.		385
7			16–54	32	1	4	Novo	1½		Water	Opt.	Belt	Own	Willard	80	32	16	S-Auto.	S-Auto.		410
9			23–65	32	1	4	Novo	1½		Water		Belt	Own		110	32	16	S-Auto.	S-Auto.		460
Fairbanks-Morse, F-3 hp	Fairbanks, Morse & Co., Chicago	900	13–100	30	1	4	Own	3	K	Water		Belt	Own		66	32	16	S-Auto.	Manual		
F-6 hp		3500	40–200	30	1		Own	6	K	Water		Belt	Own		200	32	16	S-Auto.	Manual		
Fairmont, B-4	Fairmont Gas E. & R. M. Co., Fairmont, Minn		50	32	1	2	Own	4	K & G	Water	Yes	Belt	W.E.	Edison	80	32	24	S-Auto.	Manual	Throttle	595
Garford	Garford Mfg. Co., Elyria, Ohio	600	16–62	30			Any	2				Belt		Gould	80	32	11		Manual		320
Genco, A	General Gas-Electric Co., Hanover, Pa	500	6–43	30	1	4	Own	2	Any	Water	Yes	Direct	Own	Own	110	32	16	S-Auto.	Auto.		
B		600	10–59	30	1	4	Own	2	Any	Water	Yes	Direct	Own	Own	167	32	16	S-Auto.	Auto.		
Jones, A	L. B. Jones Co., Kansas City, Mo	750	40		1	4				Water		Direct						S-Auto.	Auto.		
Lalley	Lalley Electro-Lighting Co., Detroit	1000	50	32	1	2	Own	1½	G	Water		Direct		Willard	115	32	16	Manual	Manual	Throttle	495
Lauson-Edison, 201	John Lauson Mfg. Co., New Holstein, Wis	800	7–30	50	1	4	Opt.	2½	Opt.	Water	Opt.	Belt	Own	Edison	38	50	26	Manual	Manual	Throttle	
202-30		1400	16–50	50	1	4	Opt.	2½	Opt.		Opt.	Belt		Edison	75	52	26	Manual	Manual	Throttle	
203–30		2000	22–75	50	1	4	Opt.	3½	Opt.		Opt.	Belt		Edison	112	52	26	Manual	Manual	Throttle	
206–110		3500	27–154	125	1	4	Opt.	4½	Opt.		Opt.	Belt		Edison	38		94	Manual	Manual	Throttle	
Lauson Junior, 300		500	10–25	30	1	4	Opt.	1½	Opt.		Opt.	Belt	Own		40	30	15	Manual	Manual	Throttle	
301		800	15–40	30	1	4	Opt.	1½	Opt.		Opt.	Belt	Own		60	30	15	Manual	Manual	Throttle	
Langstadt-Meyer, 6	Langstadt-Meyer Co., Appleton, Wis	600	30–45	32	1	4	L-M	3	G	Water	Yes	Belt	L-M		80	32	16	S-Auto.	Manual	Throttle	576
6½		1200	75	32	1	4	L-M	3	G	Water	Yes	Belt	L-M		80	32	16	S-Auto.	Manual	Throttle	606
7		960	72	32	1	4	L-M	3	G	Water	Yes	Belt	L-M		107	32	16	S-Auto.	Manual	Throttle	650
Main, 25-30 volt	Main Electric Mfg. Co., Pittsburgh, Pa	600	25–41	30	1	4	Own	1½	Opt.	Water	Yes	Belt	Own		60	30	15	Manual	Manual		375
40		800	40–56	30	1	4	Own	1½	Opt.	Water	Yes	Belt	Own		95	30	15	Manual	Manual		400
50		1000	50–66	30	1	4	Own	2½	Opt.	Water	Yes	Belt	Own		95	30	15	Manual	Manual		360
75		1500	22–97	30	1	4		3½	Opt.	Water	Yes	Belt	Own		130	30	15	Manual	Manual		390
50		1000	25–75	110	1	4		2½	Opt.	Water	Yes	Belt	Own		40	110	55	Manual	Manual		575
75		1500	38–113	110	1	4		3½	Opt.	Water	Yes	Belt	Own		60	110	55	Manual	Manual		680
100		2000	60–160	110	1	4		3½	Opt.	Water	Yes	Belt	Own		95	110	55	Manual	Manual		720
Marco	Marmon-Chicago Co., Chicago	1250	85–100	32	1	4	Newway	4	Opt.	Air	Yes	Chain	Dyneto	Perf't'n		32	11	S-Auto.		Electro-mag.	595
Matthews, A	Matthews Engineering Co., Sandusky, Ohio	1000	50	32	1	4	Own	3	G	Water	No	Direct	G-E	Willard	72	32	16	Auto.	Auto.	Electro-mag.	795
A-1		1000	50	32	1	4	Own	3	G	Water	No	Direct	G-E	Willard	72	32	16	S-Auto.	Auto.	Electro-mag.	695
B		2000	100	32	2	4	Own	7	G	Water	No	Direct	G-E	Willard	144	32	16	Auto.	Auto.	Electro-mag.	1,350
B-1		2000	100	32	2	4	Own	7	G	Water	No	Direct	G-E	Willard	144	32	16	S-Auto.	Auto.	Electro-mag.	1,250
C		1000	50	110	1	4	Own	3	G	Water	No	Direct	G-E					Manual	Manual	Electro-mag.	775
Mayhew, K 1	Mayhew Co., Milwaukee, Wis	2000	100	110	2	4	Own	7	G	Water	No	Direct	G-E					Manual	Manual	Electro-mag.	1,300
K 2		800	12–40	32	1	4			G	Water	Yes	Direct	Western		80	32	16	S-Auto.	Manual	Flyball	475
K 3		800	16–48	32	1	4			G	Water	Yes	Direct	Western		125	32	16	S-Auto.	Manual	Flyball	510
Mor-Lite	Fairbanks, Morse & Co., Chicago	800	22–54	32	1	4			G	Water	Yes	Direct	Western		160	32	16	S-Auto.	Manual	Flyball	550
Owen	R. M. Owen & Co., New York		15–40	30	1				G	Water		Direct				32	16	S-Auto.	Auto	Electro mag.	
Perfection, SA 1	Perfection Storage Pattery Co., Chicago	1250	100	32	1	4	Own	1¼	G	Water	No	Direct			80	32	16	S-Auto.	Auto.		
FA 6		1500	75	32	1	4		3	Opt.	Water		Direct		Own	80	32	16	S-Auto.	Auto.		600
Powerlite, 163 L 65	Montgomery Ward & Co., Chicago	1500	65	32	1	4		3	Opt.	Water		Direct		Own	40	65	32	Auto.	Auto.		800
163-L-67		650	20	32	1	4	Own	2½	G	Water	Yes	Direct	Own	Own	60	32	16	S Auto.	Manual	Throttle	348
163-L-69		650	31	32	1	4	Own	2½	G	Water	Yes	Direct	Own	Own	90	32	16	S Auto.	Manual	Throttle	365
Rohaco, Unit	Roberts-Hamilton Co., Minneapolis, Minn	650	41	32	1	4	Own	2½	G	Water	Yes	Direct	Own	Own	120	32	16	S-Auto.	Manual	Throttle	380
A-1		1500	75	32	1	4	Own	3	Opt.	Water	Yes	Direct		Opt.	75–100	32	16–24	S-Auto.	Manual	Flyball	
BE-1		500	13–40	40	1	4	Own	1½	Opt.	Water	Yes	Belt			60	30	15	S-Auto.	Manual	Flyball	*250
BE-2		800	30	50	1	4	Own	2	Opt.	Water	Yes	Belt		Edison	75	50	24	S-Auto.	Manual	Flyball	*500
B-3		1400	32–80	50	1	4	Own	3	Opt.	Water	Yes	Belt		Edison	113	50	24	S-Auto.	Manual	Flyball	*600
BE-3		2000	24–120	40	1	4	Own	5	Opt.	Water	Yes	Belt			120	32	16	S-Auto.	Manual	Flyball	*490
Swanlite	Black Swan Co., Waseca, Minn	2000	100	50	1	4	Own	5	Opt.	Water	Yes	Belt		Edison	150	50	24	S-Auto.	Manual	Flyball	*750
Swartz-Unit	Swartz Electric Co., Indianapolis, Ind	1000	50–100		1	4	Own	3	Opt.	Water	No				60–160	32	16				385–465
E		1000	50	30	1	2	Own		G	Water	No	Direct	Own	Opt.	88	32	16	S-Auto.	Manual	Electro-mag.	
F		1500	50	30	1	4	Own		Opt.	Water	Yes	Belt	Own	Opt.	88	32	16	Manual	Manual	Flyball	
Syco	Beaudette & Graham Eng. Co., Boston, Mass	2000	100	60	1	4	Own		Opt.	Water	Yes	Belt	Own	Opt.	88	64	32	Manual	Manual	Flyball	
Uni-Lectric	Uni-Lectric Corp., Detroit	1000	62-70	32	1	4	Own	3	G	Water	Yes	Direct			90-160	32	16	S-Auto.	Throttle		
Universal, 1-KW	Universal Products Co., Oshkosh, Wis	4000	240-310	110	4	4	Own	8	G & K	Water	No	Direct			60-160	110	52	S-Auto.	S-Auto.		
4-KW		660	33	110	1		Own			Water		Direct	Own		80	6	3	C-Auto.			472
West. Elect., 15-DC-90	Western Electric Co., New York	1000	150	32	1	4	Own			Water		Direct			80-130	32		S-Auto.	Auto.		435-495
15-DC-180		1000	200	32	1	4	Own		G	Water		Direct			130	32		S-Auto.	Auto.		975
Winton	Winton Eng. Works, Cleveland, Ohio	1500	75	32	1		Own	3¼	K	Air	Yes	Direct	Own		90	32	16	S-Auto.	Auto.	Throttle	
Wisconsin, 15-light	Lauson-Lawton Co., De Pere, Wis	1500	100	32	1		Own	3¼	K	Air	Yes	Direct	Own		180	32	16	S-Auto.	Auto.	Throttle	
30-light		5000	250	115	4	4	Own			Water		Direct	Own	Opt.	Opt.	Opt.	Opt.				
50-light		450	12	30	1		Own	2½		Water	Yes	Belt	Own		36	26	13	Manual	Manual		
100-light		600	24	32	1		Own	2½		Water	Yes	Belt	Own		36	32	16	Manual	Manual		
		800	40	32	1		Own	2½		Water	Yes	Belt	Own		60	32	16	Manual	Manual		
		1500	80	32	1		Own	4		Water	Yes	Belt	Own		100	32	16	Manual	Manual		

*Without engine. Opt., optional. S-Auto., semi-automatic. K, kerosene. G, gasoline. Electro-mag., electro-magnetic.

Sizes of Brake Linings for Cars

(Continued from issue of May 1)

Motor Age Maintenance Data Sheet No. 38

One of a series of weekly pages of information valuable to service man and dealer—Save this page

1916 Models

Car and Model—	INTERNAL Length	INTERNAL Width	INTERNAL Thickness	EXTERNAL Length	EXTERNAL Width	EXTERNAL Thickness
Metz	30½	1¾	5/32	13¼	1¾	5/32
Mitchell—C	44	2	3/16	40	1½	3/16
Moline-Knight—C & G	42½	2	3/16	41½	1¾	3/16
Monitor—All	34	1¾	3/16	...	...	...
Monroe—All	27⅝	1¼	5/32	28 21/32	1¼	5/32
Moon—6-40	...	...	...	40	2	3/16
Moon—6-50	...	...	...	46	2¼	3/16
National—All	45	2	5/32	43 1/16	1¾	5/32
Oakland—38	35¼	1⅞	5/32	34¾	1⅜	5/32
Oakland—50	43 1/16	1⅞	5/32	40 15/32	1⅝	5/32
Oldsmobile—43	35¾	1⅞	5/32	34¾	1⅜	5/32
Oldsmobile—44	38⅛	1⅞	5/32	35	1⅝	5/32
Overland—75	38	1¾	3/16	12½	1¾	3/16
Overland—83	41	2¼	3/16	10 3/16	2¼	3/16
Overland—84 & 86	44½	2¼	3/16	13	2¼	3/16
Owen Magnetic—						
O-36	20¾	2½	3/16	...	...	...
M-25	48¾	2½	3/16	44¾	2½	3/16
Packard—All	53 5/64	2½	¼	47½	2	3/16
Paige—6-38	38½	2	3/16	35¼	2	5/32
Paige—6-46	44	2	3/16	42	2	3/16
Peerless—56	43¾	2	3/16	38¾	2	3/16
Pierce-Arrow—6-66	20⅞	3¼	3/16	19	3	3/16
Pierce-Arrow—6-48	18¾	3¼	3/16	16⅞	3	3/16
Pierce-Arrow—6-36-38	15¼	3	3/16	13⅝	2¾	3/16
Pilot—6-45	34	2	3/16	34	1¾	3/16
Premier—6-51	49⅜	2½	3/16	44¾	2½	3/16
Pullman	31⅞	1¾	5/32	27¼	1¾	5/32
Reo—R & S	43	2	3/16	38 13/16	2	3/16
Reo—M-N & F	43	2¼	3/16	38 13/16	2	3/16
Saxon—S & S2	30½	1 15/16	3/16	12	1 11/16	3/32
Scripps-Booth—C	27⅛	1⅝	5/32	27 31/32	1¾	5/32
Singer—16	48½	2½	3/16	47½	2½	3/16
Stanley—735	32½	1¾	3/16	35½	1¾	3/16
Stearns—SK8	25	3	¼	96	2	¼
Stearns—SKL4	25	3	¼	80	1½	¼
Stephens—60-65	34 7/16	2	⅛	31¼	1¾	⅛
Studebaker—All	44 1/16	2	5/32	42½	1¾	3/16
†Stutz—C				16½	1¾	3/32
				16½	1¾	5/32
Sun—16 & 17	34	2	⅛	32	1¾	⅛
Velie—15	40¾	2	3/16	40¼	2	3/16
Velie—22	34¼	2	⅛	31½	1¾	⅛
Westcott—All	44	2	3/16	41	2	3/16
White	46	2½	3/16	...	...	...
Winton—22-22A	48¾	2½	3/16	44¾	2½	3/16

1917 Models

Abbott-Detroit—6-44	36	1¾	3/16	36	2	3/16
Allen—37	34¾	2	5/32	34¾	1¾	5/32
America—A	45	2	3/16	44	2	3/16
Apperson—All	49½	2¼	3/16	46	2	3/16
Auburn—6-44	49	1¾	3/16	...	...	...
Auburn—6-39	42½	1¾	3/16	...	...	...
Austin	42	3	¼	42	3	¼
Biddle—D				42	2	5/32
				29	1¾	5/32
Briscoe—4-24	27⅝	1½	5/32	27⅝	1½	5/32
Buick—45, 46, 47	38½	1⅞	5/32	38½	1⅝	5/32
Buick—D-34, 35	27¾	1⅝	5/32	29	1⅜	5/32
Cadillac—55	54	2½	3/16	51	2½	3/16
Case—T	44	2	3/16	42	2	3/16
Chalmers—35-A	37 3/16	1 15/16	3/16	35¼	1¾	3/16
Chalmers—35-B	43½	2 3/16	3/16	41¾	1 15/16	3/16
Chalmers—35-C	43½	1¾	3/16	41¾	1½	3/16
Chandler—All	45⅛	2	3/16	43	1¾	3/16
Chevrolet—490	27½	1¼	5/32	26½	1¼	5/32
Chevrolet—F	37 1/16	1¾	5/32	34½	1¾	5/32
Cole—860	45	2	5/32	43 1/16	1¾	5/32
Columbia—C	43½	1¾	3/16	41¾	1½	3/16
Crawford—6-40	41	2	3/16	41	2	3/16
Cunningham—V-2	53½	2½	3/16	49	2½	3/16
Dispatch—All	...	...	...	20	1½	¼
Dixie—LX	36	1¾	3/16	36½	1¾	3/16
Dodge—All	42	2¼	3/16	14⅜	1¾	3/16
Dorris—1-C-6	48½	2½	3/16	46⅞	2½	3/16
Dort—All	27⅛	1⅝	5/32	28 21/32	1⅝	5/32
Douglas—G	47⅛	2	3/16	40⅞	2	3/16
Elcar—All	40	2	1/16	36	2	1/16
Elgin—All	35⅝	1¾	5/32	34⅜	2	5/32
Empire—All	35	2	3/16	32½	1¾	3/16
Fiat—E-17	19	2	¼	19	2	¼
*Ford—T	23⅜	1⅛	5/32	No lining		
*Franklin—Series 9	28	2¾	5/32	...	...	...
	23⅞	3	3/16	...	...	...
Glide—6-40	41	2	5/32	40½	2	5/32
Grant—K	37 7/16	1¾	5/32	35¼	1¾	5/32
Hal—21 & 22	48¾	2½	3/16	44¾	2½	3/16
†Haynes—All	...	...	...	15½	1¾	5/32
Hollier—All	37 1/16	2	3/16	34 13/16	1½	3/16
Hudson—Supersix	44⅛	2	3/16	39⅛	2	3/16
Hupmobile—N	41¼	2	5/32	39⅞	2	5/32
Inter-State—T	37	1¾	3/16	36	1¾	3/16
Jackson—349 & 350	38½	2	3/16	35½	2	5/32
*Jeffery—671	40 1/16	2	3/16	...	...	...
	20 7/16	2½	3/16	...	...	...
Jones—26	43¾	2	5/32	39½	2	5/32
Jordan—B	43¾	2	3/16	38¾	2	3/16
King—EE	45	2	5/32	43 1/16	1¾	5/32
KisselKar—All	88½	2	3/16	...	...	...
Klinekar—6-38-F	67	1¾	3/16	67	1¾	3/16
Klinekar—6-38-G	67	2	3/16	67	2	3/16
Lenox—All	78	2¼	3/16	84	2¼	3/16
Lexington—All	35	2	5/32	33	1¾	⅛
Liberty—10-B	37 3/16	1 15/16	3/16	23 13/16	2½	3/16
Locomobile—All	48⅝	3	3/16	14 5/32	2½	3/16
Madison	37	2	5/32	37	2	5/32
Marmon—34	53¼	2	3/16	47⅛	1½	3/16
Maxwell—25	17⅞	1½	3/16	34⅞	1½	3/16
McFarlan—All	54	2½	5/32	49½	2½	3/16
†Mercer—All				12	2½	3/16
				47	2½	3/16
Metz	30½	1¾	3/16	13¼	1¾	3/16
Mitchell—C	39½	1½	3/16	40	1½	3/16
Mitchell—D	38½	2	3/16	35¼	2	5/32
Moline-Knight—C	42½	2	3/16	40	2	3/16
Monitor—All	36	2	3/16	...	...	...
Moon—6-66, 6-43	...	...	...	40	2	3/16
*Nash—671	40 1/16	2	3/16	...	...	...
	20 7/16	2½	3/16	...	...	...
National—All	45	2	5/32	43 1/16	1¾	5/32
Oakland—34	34¾	1⅞	5/32	35	1⅝	5/32
Oldsmobile—All	38⅛	1⅞	5/32	35	1⅝	5/32
Olympian—40	37 7/16	1¾	5/32	35¼	1¾	5/32
Overland—90	38	1¾	3/16	12½	1¾	3/16
Overland—85	41	2¼	3/16	10 3/16	2¼	3/16
Owen-Magnetic—O-36	20¾	2½	3/16	20¾	1¼	3/16
Packard—All	53 5/64	2½	¼	47½	2½	3/16
Paige—6-39	38	2	3/16	35¼	2	5/32
Paige—6-51	44	2	3/16	42	2	3/16
Peerless—56	43¾	2	3/16	38¾	2	3/16
Pierce-Arrow—6-66	20⅞	3¼	3/16	19	3	3/16
Pierce-Arrow—6-48	18¾	3¼	3/16	16⅞	3	3/16
Pierce-Arrow—6-36-38	15¼	3	3/16	13⅝	2¾	3/16
Pilot—6-45	34	2	3/16	34	1¾	3/16

*Transmission brake.
†Both brakes internal.

*Without engine. Opt., optional. S-Auto., semi-automatic. K, knockin.

Service Equipment

Time Savers of the Shop

Wilkenson Tire Vulcanizer

THE Wilkenson Vulcanizer Mfg. Co., San Bernardino, Cal., is putting on the market a new dry-cure retreader. One of the features of this vulcanizer is the radiating fins at the end of the shell, the purpose of which is to prevent overcuring, doing away with the consequent rubber sponge effect that results from overcuring. The inner portion of the shell is fitted with an aluminum matrix that has a non-skid rib.

Albertson Tool Sets

The Sioux valve set, made by Albertson & Co., Sioux City, Iowa, is complete enough to handle all the ordinary valve-reseating business the service station gets. The set is furnished with extensions and reamers from 1⅝ in. to 2¼ in. in diameter. The other set made by the same company is a set to remove bushings. It does away with the old system of spoiling bushings by removing them with punches and cold chisels and the like.

Springfield Circle Cutter

The Springfield Circle Cutter, made by the Shawyer Co., Springfield, Ohio, is an indispensable article for the repair shop. It enables the shop to make lamp lenses, metal discs for lamp dimmers, rubber, felt and leather washers and rings for clutch facings etc. The machine has a positive measuring scale so that circles of any size may be cut by setting the scale to the required diameter. The machine comes equipped with a glass cutting tool, two knives for square edge cutting, so that a gasket may be cut with one setting, and a special knife for bevel edged disks. The price is $12.00.

Detroit Show Case

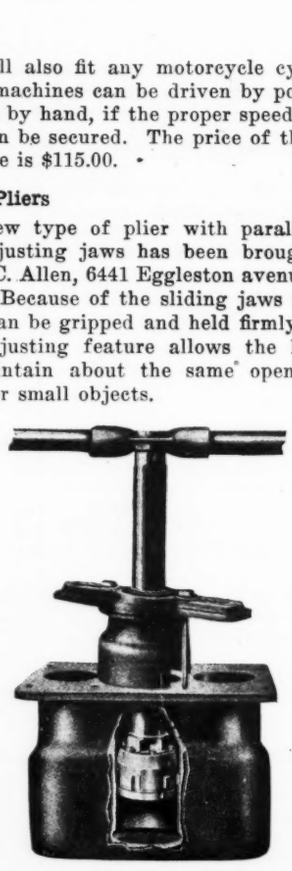
The Detroit Show Case Co., Detroit, is making a small show case that the dealer will find very valuable for his accessory display. It helps to systematize the small parts handling and gives a visible record of the supplies on hand. The case has fifty-five compartments and each one has a designation holder. It is suited for holding small parts, such as nuts and bolts, washers, grease cups and other sundries which are generally kept in a convenient cigar box.

Storm Boring Machine

The Storm Mfg. Co., Thompson, Iowa, offers a standard boring machine that will fit any sized engine now in use on motor cars, fitting cylinders 2⅝ in. to 5 in. It can be used with equal facility on V-type blocks, as well as on the vertical block, and will also fit any motorcycle cylinder. These machines can be driven by power as well as by hand, if the proper speed reduction can be secured. The price of this size machine is $115.00.

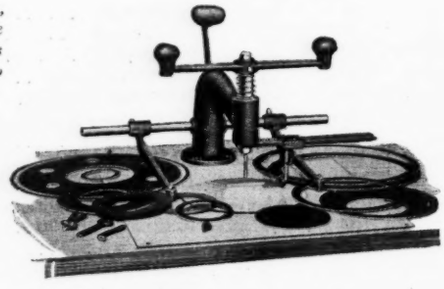
Allan Pliers

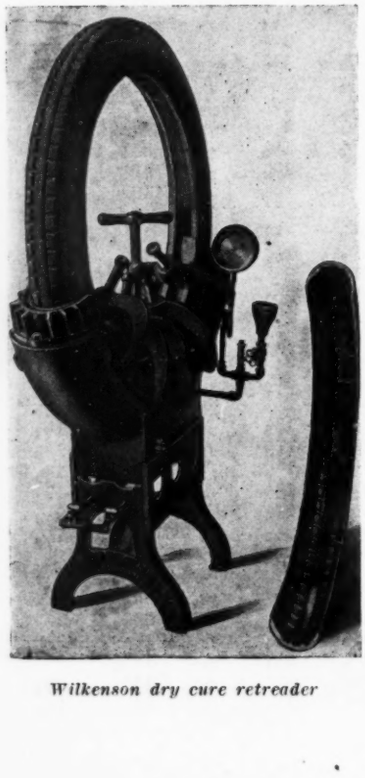
A new type of plier with parallel and self-adjusting jaws has been brought out by A. C. Allen, 6441 Eggleston avenue, Chicago. Because of the sliding jaws flat objects can be gripped and held firmly, while the adjusting feature allows the handles to maintain about the same opening on large or small objects.



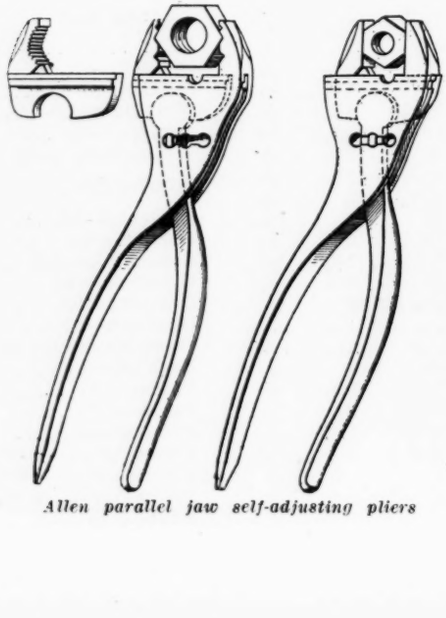
The Storm boring machine can be used on blocks of 2⅝ to 5 in size. It will fit V type blocks as well and can be power driven

The Springfield circle cutter will cut glass, fibre and composition for gaskets. The equipment includes all the necessary tools Sioux valve set includes sizes from 1⅝ to 2¼ in.

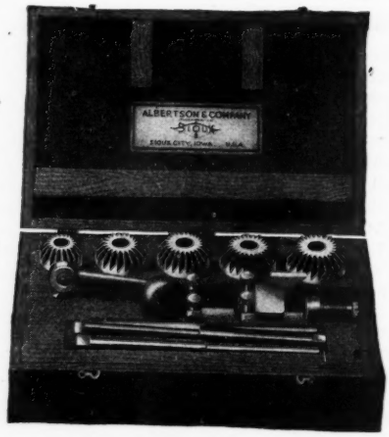




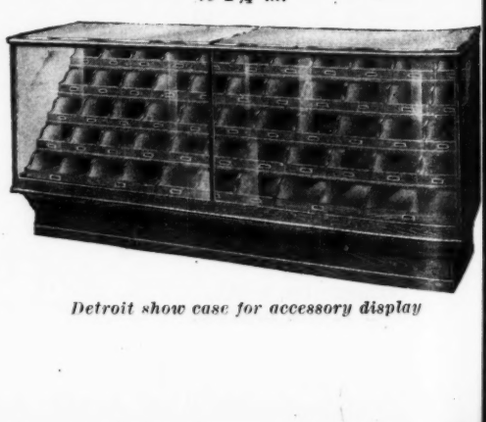
Wilkenson dry cure retreader



Allen parallel jaw self-adjusting pliers



Sioux valve set, includes sizes from 1⅝ to 2¼ in.



Detroit show case for accessory display

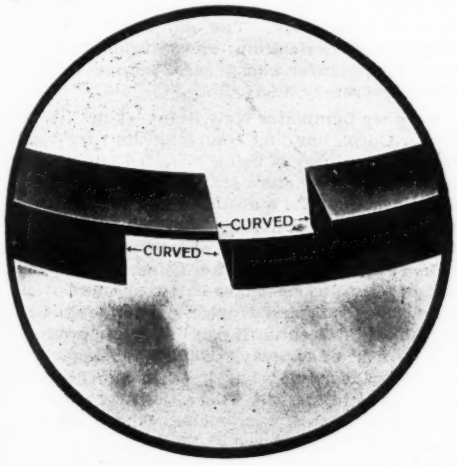
The Accessory Corner
New Fitments for the Car

Munger Piston Ring

THE Splitdorf Electrical Co., Newark, N. J., has developed a new ring for which is claimed a gas-tight joint even though the cylinder wall be worn slightly out of round. The ring is of the eccentric type, which types gives a more uniform wall pressure theoretically, but have always had the objection that the wear at the joint was excessive. With this ring the special joint with its curved surface helps to do away with that objection. The character of the joint does not demand such close fitting to maintain a gas-tight cylinder.

Toledo Grease Cup

A departure from standard grease cup design is seen in the Toledo cup, made by the K. M. Mfg. Co., Toledo, Ohio. This cup has no threads that can be crossed, for it is removed by sliding off holder and applied by sliding the cup back into place. The plunger action operates by turning the knurled portion, which forces the plunger up into the cup and thus displaces the grease.



The Munger ring joint offers a radial surface which is in contact at all times

Valveless Tire Pump

The Rex valveless tire pump is engine driven and offers the advantage that there are no ball check valves to become fouled with oil or dust. The operation is explained from the illustration. Upon rotating the crankshaft the piston is given a reciprocating motion by the ball and socket joint I. The oscillating of the piston opens and closes the intake and outlet ports G and C. When the piston is up the air is permitted to enter through the port D in the chamber E, where it is compressed when the piston comes down. The air then enters the upper chamber through the port and further is compressed and then released through the port C. The pump is made by the Rex Machine Co., Chicago.

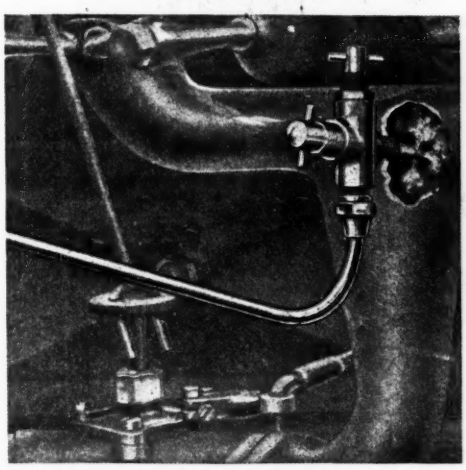
Dust-proof Priming Cock

The Roberts Brass Mfg. Co., Detroit, has brought out a dust-proof priming cock very similar to other priming cocks except that the handle, which is a stamping, has a small circular cover plate integral with it. This is twisted over to cover the top of the priming cup, when the cock is closed. This prevents the settling of dust in the cup and is sold for use with cars, motorcycles, trucks, motor boats, tractors, etc.

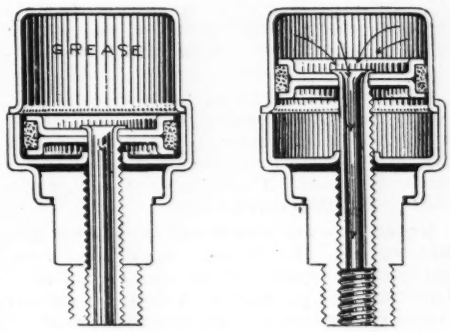
Aerodyn Valve

The Aerodyn valve is an automatic device that takes hot air from the carbureter stove and admits it to the manifold as close to the cylinders as the manifold construction permits. It is equipped with an extra valve that permits of engine priming. The article is made by the Standard Auto Mfg. Co., Syracuse, N. Y., and sells for $4.50.

The Roberts priming cup has a dust-proof cap over the top



The Aerodyn valve shoots hot air into the intake manifold

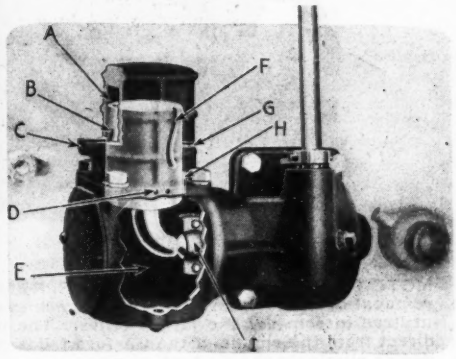


There are no threads to cross on the Toledo grease cup

Sterling Jacks

The Republic Auto Parts Co., Long Island City, N. Y., is offering a set of jacks built for heavy service. They are equipped with a double-adjustment device and have the lever and pawl arrangement so the downward stroke of the handle does the work whether the load is being raised or lowered. The sliding adjustment permits of use under low axles where otherwise the jack could not be used.

Sterling jack double lift, making low places getatable



The Rex pump operates without the aid of valves, ports serving in their place

Among the Makers and Dealers

Short Trade Notes

BAY CITY Plant Incorporates—The Bay City Body Co., Bay City, Mich., has recently been incorporated for $20,000. It has a plant of its own and contemplates building an addition in the near future.

Opens New Garage at Little Rock—G. G. Storm and L. O. Brooks, Little Rock, Ark., have opened a garage at Tenth street and Broadway. The firm will do a garage and repair business. It also has the agency for the Air-Friction carbureters.

Ungar Becomes Vice-President of SKF Ball Bearings—G. A. Ungar, who has been engineer and technical director of the SKF Ball Bearing Co., New York City, for several years, has resigned to become vice-president of the company, of which he has been a director since its organization.

National Engineering Has 200 Men—The National Engineering Co., Saginaw, Mich., acquired some time ago by the General Motors Corp., is employing about 200 men, but it is said the force will be doubled in a short time. The company makes the engine crankshaft for the Oakland Motor Car Co.

Battery Company Leases Building—The Willard Storage Battery Co., Jackson, Mich., has leased new quarters and is making extensive improvements. Inside service is the aim of the company and arrangements will be made to have the cars parked inside so there will be no handicap in the way of weather conditions.

To Sell Franklins in Toledo—The Franklin-Biddle Co., Toledo, Ohio, has just opened to handle the Franklin sales in Toledo and twelve Ohio counties. Walter C. Biddle, for four years assistant sales manager of the Franklin Co., is principal stockholder. Ernest P. Johnson, who has been with the Franklin Automobile Co. since 1915, succeeds Walter C. Biddle, who resigned to handle Franklin distribution in Toledo.

Hill Joins Torbensen—Peter T. Hill has joined the sales department of the Torbensen Axle Co.

Gunion Assistant Manager—P. C. Gunion is now assistant manager of the new Industrial Division of the General Motors Corp.

Packard Service Men Get Watches—For devotion to duty 135 employes of the Packard Motor Car Co. were presented with gold watches by the Packard company this week.

To Sell Star Tires—Ferd N. Neuhausel, Toledo, Ohio, recently returned from the service, has joined the Camel Tire Co., and will be in charge of Toledo territory sales of Star tires.

Weller Now with Motor Co.—J. H. Weller, formerly assistant production superintendent of the Packard Motor Car Co., Detroit, has been appointed assistant to B. W. Burtsell, president of the Herschell-Spillman Motor Co., and will be in charge of production.

To Erect Costly Garage—Purchase this week by H. M. Dunlop, president of the Dunlop Milling Co., Clarksville, Tenn., of certain property for a consideration around $20,000, was followed by the announcement that the erection of a garage, costing approximately $25,000, will be started at once. Outside capital is interested.

Bay County Agent for Mitchell—The Capitol Auto Co., Lansing, Mich., which handles the Dodge Brothers and Mitchell lines, has appointed Louis Garrison Bay County agent for the Mitchell motor trucks and cars. Garrison is opening new quarters in Bay City. The Capitol Auto Co. is establishing branches in twenty-five Michigan counties, all of which will get their trucks and motor cars from the Lansing stock.

Build New Garage—Work has started on the new garage of Bishop & Braidwood, Armada, Mich. The building will be of brick 70 by 112 ft., one-story high.

Apperson Opens in Detroit—The Apperson Detroit Motor Car Co. has just been organized to handle the sales of the Apperson cars in Detroit and Michigan. George B. Emerson is president of the new firm. E. J. Baird is sales manager. The company has opened its sales and service station and has two models on display.

Hayes Wheel Executes Mortgage—The Hayes Wheel Co. of Albion and Jackson, Mich., is said to have just executed a mortgage for $2,000,000 in favor of the Illinois Trust & Savings Bank and Francis A. Bonner of Chicago as trustee. It is stated that $1,000,000 of the issue will soon be floated. The issue will bear 7 per cent interest.

To Make Motor Car Tires—The Erie Tire & Rubber Co., Sandusky, Ohio, will begin the manufacture of motor car tires about August 1. The company will specialize in cord tires and tubes. The various factory units are nearing completion. The Erie Tire & Rubber Co. is organized under the laws of Ohio with an authorized capital stock of $1,000,000, half of which is 7 per cent cumulative stock and half common stock. The officers are: President, C. H. Berlekamp; vice-president, H. H. Forest; treasurer and general manager, P. F. Wills; secretary, C. H. Roth.

Climber Completes New Plant—The Climber Motor Corp., has just completed its new plant here. Machinery is being installed and operations will start before May 15. The plant is a one-unit, one-story affair, made of concrete, steel and glass, 100 ft. by 300 ft. in dimensions with 30,000 sq. ft. floor space. Other units will be built later. The Climber Co. will manufacture a passenger car, truck and tractor. The truck and tractor departments will not be established until passenger car production is well under way. George Schoeneck is chief engineer. He has been in charge of a small shop in Detroit where the first Climber experimental cars were made. The plant will start work with a force of 100 men. It is proposed to produce ten cars daily during the first year. H. F. Buhler is sales manager of the company.

Seamless Steel Tube Builds—The Detroit Seamless Steel Tube Co., has begun construction of a $3,000,000 plant on a 60-acre tract on Warren avenue. The first section, cositng $1,000,000, will be completed by January 1. The company's present location has been sold to the Pennsylvania Railroad. Building plans call for a structure of steel and glass with brick and concrete facing. The roof will be of tile. The plant proper will occupy a space of 350 by 550 ft. It will consist of three bays for manufacturing units, a separate heating plant and a two-story administration building. The three manufacturing units will each be 90 by 550 ft. and 45 ft. high. A subdivision will be created in the vicinity of the building and 150 homes built for workmen of the company. The total capacity of the first unit will be 2,500 tons of seamless steel tubing a month, the range of sizes being from ½ in. to 6 in. in diameter. The tubing is used in the manufacture of

MOTOR-DRIVEN POWER-BLOWER REMOVES ASHES FROM CELLARS—Dustless removal of ashes from cellars is the achievement of this new apparatus which is being utilized in some of the larger cities. The blowing device of 39 horsepower is operated direct from the engine of the Garford truck upon which it is mounted. Not only does this device eliminate the dust which often is so annoying to passers-by, but it reduces labor to a minimum. So satisfactory has been its work that it promises to be more universally adopted. The blower and truck shown in the accompanying photograph are the property of Ash Removal, Inc., New York City

locomotives, motor cars, trucks, tractors and stationary boilers. The company has been in business 19 years.

New Tire Shop for Peoria—Ray D. Fern, Peoria, Ill., has opened a new tire repair shop at 428 Liberty Street.

Weber Made Advertising Manager—J. E. Weber succeeds W. Milton Koenig as advertising manager of the Weber Implement & Automobile Co., distributor in St. Louis of the Chalmers, Maxwell and Hupmobile.

Japanese Agency for Traffic Motor Truck Corp.—J. Uyeno of the Taishi Trading Co., Ltd., of San Francisco, obtained the Japanese agency for the Traffic Motor Truck Corp., St. Louis, while in that city recently.

New Service Manager—F. H. Haack has been appointed manager of service for the Moerschell Electric Co., St. Louis representative for Connecticut ignition, Splitdorf magnetos, Webster oscillators and U. S. L. batteries.

Tractor Ignition Makers to Build—The Webster Electric Co., Racine, Wis., manufacturing ignition devices and specialties for the automotive industries, is preparing to build a two-story addition, to be used for an extension to the power plant as well as the factory.

New Rock Island Garage—William aHmilton, Rock Island, Ill., and C. W. Nash, late of Des Moines, Ia., have formed a partnership and opened a garage at 1725 Fourth Avenue, Rock Island, to be known as the Auto Shop. Accessories will be handled and a repair and storage business given attention.

Join Sales Force of St. Louis Dealer—J. L. Steele, formerly with the Pennsylvania Rubber Co., Philadelphia, and W. C. Pfeiffer, formerly a motor car dealer in St. Louis, are recent additions to the sales force of the Neskov-Mumperow Motor Car Co., Anderson distributor and Dort retailer in St. Louis.

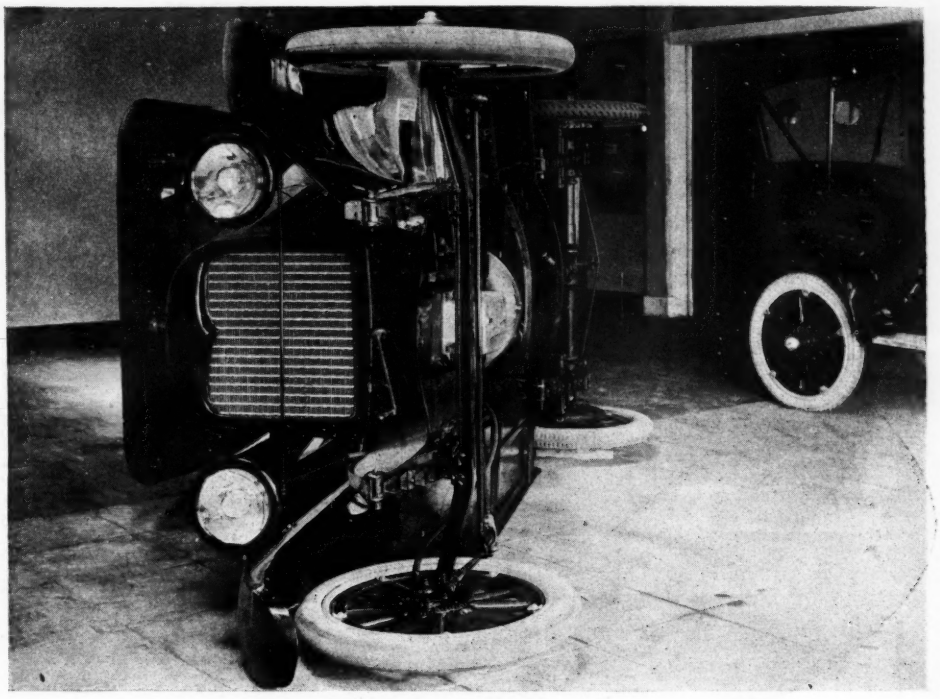
Oldberg Increases Factory—The Oldberg Mfg. Co., Detroit, maker of motor cars and marine mufflers, will greatly increase its manufacturing facilities through the purchase of a large three-story brick factory building on East Grand boulevard. The building was formerly occupied by the O'Neill Mfg. Co. and its value is approximately $85,000.

Alfred Faber Joins Electric Co.—Alfred Faber, formerly of the Automobile Ignition Co., and James McGarity, formerly of the Chandler Motor Car Co. and the Packard-Missouri Motor Car Co., have joined the service staff of the Automotive Electrical Service Co., Inc., Delco, Remy, Northwest and Klaxon service distributor in St. Louis.

Ray Wice Again with Frampton—Ray Wice, for several years a salesman with the Hudson-Phillips Motor Car Co., St. Louis, has returned to that city to be connected with the Hudson-Frampton Motor Car Co. after having sold Hudson cars in Cleveland for the last four months. The Hudson-Frampton Co. distributors also announce the appointment of E. C. Anderson as wholesale territorial manager.

Oakland Adopts 48-Hour Week Plan—The Oakland Motor Car Co., Pontiac, Mich., beginning May 8, will put its entire plant on a 48-hour week basis. The plan calls for beginning at 7 a. m., a 50-minute noon hour and closing at 4:30 p. m. The usual half-holiday Saturday is allowed. To keep wages as near the old standard certain increases in piece rates and hourly rates have been allowed.

Danville Concern to Make Hubs—The Allith-Prouty Co., Danville, Ill., engaged in the manufacture of steel and iron products, has installed new machinery and will turn out motor car hubs and other parts for power vehicles. Thirty additional machinists will be required to take care of the new line. The new machinery will have a capacity of 50,000 motor car hubs a month, while the machines and output will be increased as rapidly as business warrants. The war contracts have all ben filled and the plant will hereafter handle the regular line of business.



GETTING A WORM'S EYE VIEW OF CAR—This novel method of displaying a car to potential buyers is used by the Buquor Motor Co., El Paso, Texas, distributors for the Maxwell

Battery Service Station in Decatur—Fred Armstrong, Decatur, Ill., has opened a new battery service station at 237 South Park Street.

Moon Makes Foreign Contract—The Moon Motor Car Co. of St. Louis on Thursday closed a contract with a large dealer in motor cars to handle its Victory six from Sidney, Australia. The contract was for 300 cars.

Chalmers Agency in Dayton—The distribution of Chalmers cars for the territory around Dayton, Ohio, has been awarded to the Gem City Auto Sales Co., with salesrooms on the corner of Stratford and Monument avenues.

Hackett Joins Oshkosh Truck—Captain Wakeman Hackett, recently released after 20 months in service, has become associated with the Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis., as factory representative covering the Middle West.

F. J. Miller & Son Get Patterson Agency—The Patterson motor car will be represented in Dayton by F. J. Miller & Son. They have been unable as yet to locate a permanent salesroom but expect to get fully established within the next 10 days.

Modern Grinder Mfg. Co. Increases Stock—The Modern Grinder Mfg. Co., 157-159 Buffalo Street, Milwauke, manufacturer of mechanical and manual tools, has increased its capital stock from $10,000 to $25,000 to keep pace with the expansion of its business. The output is being increased.

Decatur Vulcanizing and Oil Business Sold—C. W. Miller, Decatur, Ill., has purchased the fixtures, vulcanizing plant and oil business of the late Bittel-Leftwich Co., 241 East Main St. The latter company with headquarters in Springfield, Ill., has ben operating a motor car accessory store in Decatur, but the branch was found unsatisfactory.

Ignition Plug Co. Locates in Louisville—The Ignition Plug Co., Dayton, Ohio, has established a plant at Fourteenth Street and Broadway, Louisville, Ky., and is preparing to manufacture spark plugs. The company is capitalized for $50,000, with the following officers: President, E. R. Stucky; vice-presidents, H. C. Smith and C. D. Rodman; secretary and treasurer, W. T. O'Neal; assistant secretary, A. C. Reager.

Zeelee Approaches Watseka—The Commercial Club of Watseka, Ill., is considering a proposal from the Zeelee Tractor Co., St. Louis, Mo., to erect a tractor manufacturing plant to cost $400,000. Two hundred men will be employed at the start.

New Dealer at Carlinville—The Carlinville, Ill., Motor and Implement Co. has been organized, composed of H. W. Woodmansee, W. A. Craggs, Alex. Crawford and J. E. Borman, and a garage will be erected to cost $25,000.

Rim Remover to Be Made in St. Louis—J. L. Niswander, Quincy, Ill., inventor of a rim remover for motor vehicle wheels, has closed a deal with the Simplex Steel Co., St. Louis, Mo., for the manufacture of the device. The invention has been manufactured in Quincy, but the facilities were limited.

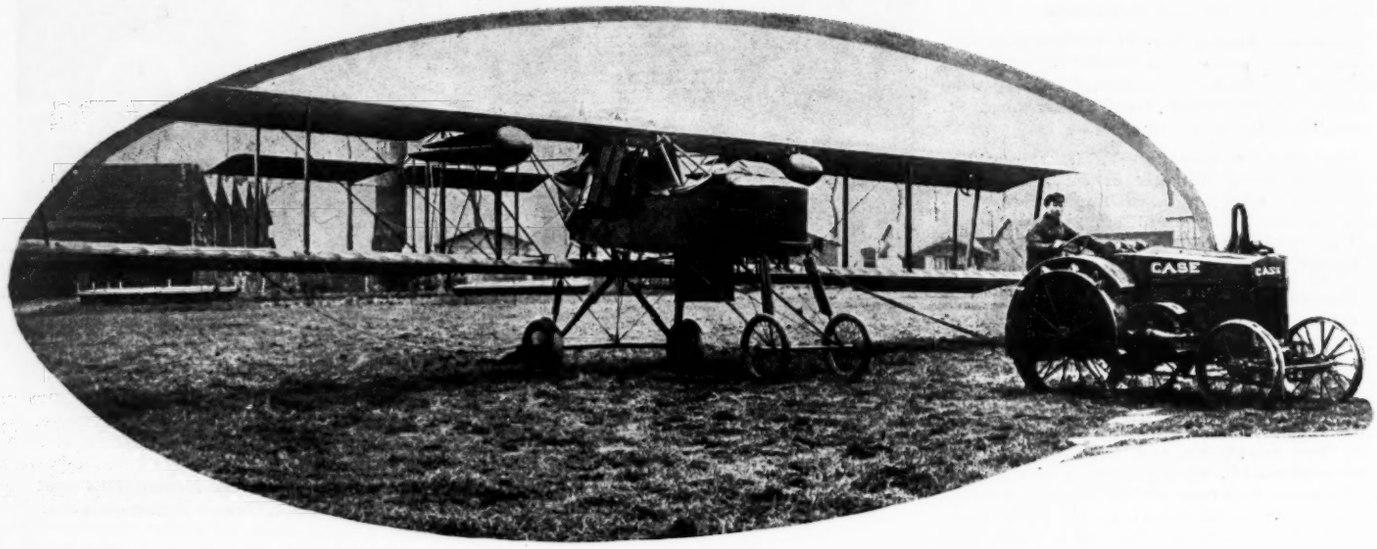
Central Auto Co. Buys Garage—H. H. Towne, Rockford, Ill., has purchased the stock of the S. M. Jacobs motor car accessory store at Janesville, Wis., known as the Rink garage, and will move the business to Rockford, consolidating it with the Central Auto Co. of the latter city. A number of the employes will be brought to Rockford.

Nebraska Buick Has Assistant Manager—R. E. Gerspacher, formerly district manager out of Cleveland, Ohio, for the Michelin Tire Co., Milltown, N. J., has joined the Omaha, Neb., house of the Nebraska Buick Auto Co. as assistant manager to Lee Huff. Mr. Gerspacher will also manage the accessory department, both retail and jobbing.

Quincy Concern Expands—The Morris-Adler Motor Car Co., Quincy, Ill., has opened a branch at Maywood, Adams county. W. R. Kelly has been placed in charge as manager. From time to time similar branches in the western Illinois and eastern Missouri territory will be opened. It is believed that there is a field for such branches, specializing in the motor vehicle accessories and parts.

From the Four Winds

Glimpses at the World of Motordom



CASE TRACTOR HAULS LARGE AIRPLANE—This picture illustrates a Case tractor at work in one of the aerodromes in France. Tractors have been found to be very successful for pulling planes out of their hangars and for towing in disabled machines. The plane in the picture is one of the large Farman machines. While it might impress the reader at first glance that this is just a novelty picture, yet it proves to him the adaptability of the modern tractor. It is true that the tractor was designed and built primarily to be used for agricultural purposes, but it is being fast drafted into other industries. Already thousands of tractors are being used for road construction, many are being used to displace horses for work around large manufacturing plants

HERE'S One of Those Horseless Farms—Horseless farms are on the way. George E. Maurer, a farmer of Stephenson county, Illinois, has disposed of the last of his horses and is fully converted to power farming. He is the first in that county to do away with horses absolutely, but many of his neighbors, who are now being converted to tractors and trucks, expect to follow his example within another year. Just to demonstrate what his tractor could do in an emergency, he double-disked and harrowed 40 acres of his farm in a single day of 12 hr. His neighbors, who were called in to inspect the job, agreed that it was done more thoroughly and more evenly than if horses had been used. Mr. Maurer estimated that it would have taken him a week to do the work that his tractor performed in a single day.

East Michigan Pike Tour—The East Michigan Pike Association has completed plans for its fourth annual tour. This will be the last probably, as the passage of the $50,000,000 bond issue has insured the completion of the pike, for which the tours were started. Sault Ste. Marie is again the terminus. The tourists will leave Detroit July 6, lunch at Flint and spend the night at Saginaw, where a meeting may be held. Lunch will be at Standish the second day, with East Tawas that night. The tourists will camp here and at Houghton Lake. Meetings will be staged at every town July 8. The afternoon of July 10 and July 11 will be spent in Sault Ste. Marie. A program has been arranged by the motor club and other organizations. It is planned to return to Detroit July 15.

Eighty-eight Miles of Road Built—A total of 88.19 miles of road was constructed under the forestry road funds during the past year, according to the department's official report. At the end of the fiscal year forty-three projects were under co-operative agreement involving the survey of 1,061.85 miles and the construction of 664.15 miles.

What'd Parades Do Without 'Em?—Nearly 200 cars carried the wounded soldiers in the parade of the Yankee division at Boston recently. About 100 of these cars were driven by those in the Red Cross Motor Corps. Some 200 other cars brought wounded soldiers from the hospitals to view the parade, and a third contingent of motorists carried the 101st regiment of engineers from Camp Devens to Boston for the parade and back again.

Motor Cars Cut Branch Railroad Fares—Passenger travel on the railroad branch lines in Arkansas has been reduced 50 per cent as a result of the widespread use of motor cars, according to B. F. Bush, regional director, in a plea before the Texas railroad commission against the proposed order to reinstate certain passenger trains. Traffic on the main lines also has been affected seriously. With the building of good highways and the restoration of business to normal the number of motor cars and the extent of their use for long-distance travel will increase, and railroad passenger traffic will decrease.

Coming Motor Events

SHOWS

Bristol, Va		May 10-17

MEETINGS

Hot Springs, Va	Automotive Equipment Association	June 2-6
Chicago	National Gas Engine Association	June 2-3
Ottawa Beach, Mich	Society of Automotive Engineers	June 23-27

TRACTOR DEMONSTRATIONS

Denver, Col	Sectional Tractor Demonstrations	June 8-14
Wichita, Kan	Automotive Committee of National Implement Assn	July 14
Aberdeen, S. D	Sectional Tractor Demonstrations	August 18-22
Ottawa, Ont., Canada	Inter-Provincial Plowing Match and Tractor Demonstrations	October

RACES

Uniontown, Pa	May 17
Indianapolis, Ind	May 31
New Nork	June 14
Tacoma, Wash	July 4
Cincinnati, Ohio	July 5
Uniontown, Pa	July 19
New Nork	July 26
Elgin, Ill	Aug. 22-23
New Nork	Aug. 23
Uniontown, Pa	Sept. 1
New Nork	Sept. 20
Cincinnati, Ohio	Oct. 1